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POLLUTION OF THE INTERSTATE WATERS OF THE GRAND CALUMET RIVER, LITTLE CALUMET RIVER, CALUMET RIVER, WOLF LAKE, LAKE MICHIGAN, AND THEIR TRIBUTARIES. PROCEEDINGS OF CONFERENCE (TECHNICAL SESSION), HELD AT CHICAGO, ILLINOIS ON JANUARY 4-5, 1966. VOLUME 3.

Federal Water Pollution Control Administration
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VOLUME 3

LAKE MICHIGAN
Chicago
ILLINOIS
INDIANA

Conference

In the matter of Pollution of the Interstate Waters of the Grand Calumet River, Little Calumet River, Calumet River, Wolf Lake, Lake Michigan and their Tributaries

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TECHNICAL SESSION
JANUARY 4-5, 1966

FEDERAL WATER POLLUTION CONTROL ADMINISTRATION

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* * *

WEDNESDAY, JANUARY 5, 1966

9:45 A.M.

MR. STEIN: May we reconvene?

You know, since my distinguished colleague from Illinois, Mr. Klassen, has become an international expert, he has to exchange greetings in 57 different languages. That is why it takes us a little longer to get started. (Laughter) But our global position is in much better shape.

Mr. Poole, will you continue with the Indiana presentation?

MR. POOLE: I want to introduce E. D. Keiper, Refinery Manager for the Mobil Oil Company of East Chicago.

STATEMENT OF
E. D. KEIPER, JR.,
MANAGER, MOBIL OIL COMPANY,
EAST CHICAGO, INDIANA REFINERY

MR. KEIPER: I have taken the liberty to shorten considerably the document that I have handed out here to the conferees so it won't take as long as it might look here.

MR. STEIN: I would like the record to show that Mr. Nicholas Melas will be the acting conferee for the Sanitary District of Chicago. He is a member of the Board of Trustees and will be sitting in the temporary absence of the President, Frank Chesrow.

Thank you.

MR. KEIPER: Chairman Stein and Conferees, ladies and gentlemen:

I am Edward D. Keiper, Manager of Mobil Oil Company's Refinery, located in East Chicago, Indiana.

Chairman Stein, I would like to ask that the document that we handed out to the conferees be entered into the record, please.

MR. STEIN: Without objection this will be entered into the record as if read, including the tables.

E. D. Keiper, Jr.

MR. KEIPER: When I last appeared before this conference, I discussed Mobil Oil Company's historic policy of full cooperation with Federal, State and local agencies for controlling water pollution. I also described the water pollution abatement systems at the East Chicago Refinery; reviewed our past pollution abatement efforts; and summarized the pollution abatement work planned or in progress.

I mention these facts now because I think it is important to recall that the abatement of water pollution has been and remains a continuing concern of both my company and myself.

Following the March 1965 Water Pollution Conference at McCormick Place, our activities concerning water pollution abatement were intensified to achieve the goals set by the conference. The specific recommendations of the conference which apply to Mobil's East Chicago, Indiana Refinery are:

Item 10 - _ _ _ "Industries will institute housekeeping practices which will minimize the discharge of wastes from industrial sewers_ _ _ _."

Item 11 - _ _ _ "Industrial plants discharging wastes _ _ _ shall institute programs of sampling their effluents to provide information about waste outputs_ _ _ _."

Item 12 - "The Indiana Stream Pollution Control Board _ _ _ will develop a time schedule for construction of necessary industrial waste treatment facilities._ _ _"

Through our continuing efforts in these areas we have been able to reduce pollutant concentrations remarkably, below the amounts shown for our effluent water in the GLIRB Survey of October 30 and 31, 1963, as follows:

(Table 1 follows:)

TABLE 1

QUANTITIES OF INDUSTRIAL WASTES DISCHARGED FROM MOBIL REFINERY INTO INDIANA HARBOR CANAL, A.P.I. SEPARATOR EFFLUENT

CONTAMINANT	POUNDS PER DAY		PERCENTAGE REDUCTION
	GLIRB SURVEY, OCT. 30, & 31, 1963	1965 AVERAGE, JULY 13-DEC. 13	
PHENOLS	775	25	96.8
AMMONIA-NITROGEN	1,355	62	95.4
SULFIDES	18,300	9	99.9
BOD (5-DAY)	3,050	2,275	25.5
OILS	546	254	53.4

E. D. Keiper, Jr.

Let us take a look at our activities concerning each of the three pollution conference recommendations, beginning with Item 11.

Item 11 - Development of an Effluent Water Sampling and Testing Program, to Provide Information About Waste Outputs

This activity is discussed ahead of those pertaining to Items 10 and 12 because it received much emphasis immediately following the March 1965 Pollution Conference.

To implement our study of water pollution, in the refinery's effluent streams, several company organizational changes were made to assign more direct responsibilities for the monitoring and control of the refinery's effluent streams, especially during the two-month period beginning May 6, 1965. A coordinator was appointed, an operations supervisor was assigned to water pollution study, an analytical laboratory supervisor was borrowed from our Headquarters Laboratory, and an additional chemist was assigned permanently to waste water analysis work.

Considerable laboratory effort was concentrated upon the development of laboratory analytical methods which were to be used routinely for analyzing our various refinery waste water streams. Once this work was completed we began a comprehensive surveillance survey to determine the quality of our five significant waste water streams. Each of these streams was sampled over a 24-hour period on three different occasions, analyzing for pollutants, as directed by a representative of the Indiana Stream Pollution Control Board.

The requested surveillance survey of water quality was completed in late June 1965. The specific waste streams analyzed and their approximate daily flow rates are shown below:

Waste Stream Identification	Flow Rate, Million Gallons/Day
API Separator Effluent	1.75
Boiler House Blowdown	0.17
Filter Back Wash	0.04
North Dock Well Point Pump	0.04
Ballast Tank Effluent	0.21

Table 2 shows the specific tests run on the five waste water streams which were included in the Water Quality Surveillance Survey.

(Table 2 follows:)

MOBIL OIL COMPANY
REFINERY
EAST CHICAGO, INDIANA
TABLE 2
SURVEILLANCE ANALYSIS

SOURCE	pH	TEMP.	FECAL STREP.	COLI-FORMS	B.O.D.	C.O.D.	PHEN-OL	CN-	SUS. SOLID	SUL-FATE	N_2 AS NH_3	N_2 AS NO_3	N_2 ORG.	PHOS-PHATE	ALKA-LINITY	CL-	FLOWS AS REQ.
A.P.I. SEP. EFFLUENT	A 11 ①	A 6	S 3	S 3	A 11 ①	A 9 ①	A 11 ①	A 5	A 11 ①	A 4	A 11 ①	A 4	A 7	A 4	A 4	A 9	A 11
BOILER BLOW-DOWN	A 3	A 3	S 3	S 3	A 3	A 3	A 3	A 3	A 3	A 3	A 3	A 3	A 3	A 3	A 3	A 3	A 3
FILTER BACK-WASH	A 3	A 3	S 3	S 3	A 3	A 3	A 3	A 3	A 3	A 3	A 3	A 3	A 3	A 3	A 3	A 3	A 3
N. DOCK WELL PT.	A 3	A 3	S 3	S 3	A 3	A 3	A 3	A 3	A 3	A 3	A 3	A 3	A 3	A 3	A 3	A 3	A 3
BALLAST SYSTEM	A 3	A 3	S 3	S 3	A 3	A 3	A 3	A 3	A 3	A 3	A 3	A 3	A 3	A 3	A 3	A 3	A 3

LEGEND

S = STATE OF INDIANA; SUBSCRIPT IDENTIFIES NUMBER OF ADDITIONAL ANALYSES REQUIRED.
A = ADEQUATE ANALYSES HAVE BEEN MADE; SUBSCRIPT IDENTIFIES TOTAL NUMBER OF ANALYSES COMPLETED;
SUBSCRIPT IN CIRCLE IDENTIFIES NUMBER OF 6-HOUR COMPOSITE SAMPLES ANALYZED.

NOTE: ALL ANALYSES WERE MADE ON 24-HOUR CONTINUOUS SAMPLED COMPOSITES UNLESS OTHERWISE INDICATED.

From the results obtained in the above survey, the Indiana Stream Pollution Control Board recommended that the API Separator Effluent be sampled over each 24-hour period, and analyzed as follows:

Flow Rate
Temperature
pH
Oils
Suspended Solids
Chlorides
Phenols
Ammonia Nitrogen
COD
BOD
Sulfides

Further recommendations advised our discontinuance of testing on two of the minor streams, "Boiler House Blow Down" and "Filter Back Wash," which were found to contain minimal contaminants. However, the two other minor streams, "North Dock Well Point Pump" and "Ballast Tank Effluent," were to be sampled and analyzed weekly. The recommended test program went into operation on July 13, 1965 and has been followed, with minor modifications, to the present time.

E. D. Keiper, Jr.

To provide representative samples of the major refinery API separator effluent stream, automatic sampling equipment and instruments to continuously record both temperature and pH were installed.

Test results obtained from the above quality control program have been forwarded monthly to the Indiana Stream Pollution Control Board, beginning with our April 1965 report. Pollutants are calculated, in terms of pounds per day, for each sample analyzed. From these values daily average quantities are derived for each month.

During the year special laboratory tests were made on the individual water streams originating within the refinery to determine the degree of pollution each might contribute to the API separator effluent stream. These studies will be continued to gain a better understanding of quality variations, and to help implement a program which would reduce source pollutants.

Now let us review our accomplishments concerning:

Item 10 - Maintaining Housekeeping Practices Which Will Minimize the Discharge of Wastes from Industrial Sewers

Most of our activities concerning this objective were concentrated within each of the following areas:

E. D. Keiper, Jr.

1. Education and training of employees in pollution control methods.
2. Elimination of chemical wastes and other pollutants from the refinery sewer system.
3. Reduction of waste water flow volumes.

No doubt one of the most important phases of pollution control is the continuing reeducation of all employees to recognize the tremendous influence their daily operating practices can have upon refinery effluent water quality. We have continued to educate our people to think in terms of water pollution, in the performance of their regularly assigned duties. This program has been reemphasized through the use of various techniques.

These are, as an example, posters and programs, and so forth, of which the Indiana Stream Pollution Control Board people are well aware and which they seem to like very much. It is a program of continually keeping in front of the individual the objective of thinking about this thing. It is like safety. It is something that you have to continually think about.

To communicate elementary information to the employees, special meetings were held, particularly at the beginning of our pollution control drive. These meetings were supplemented by discussions in daily

Operating Department Supervisors' meetings concerning pollution control progress.

New operating instructions were written and issued for proper control of the API separator which separates oil from our major waste water effluent stream.

The use of posters located in each processing area of the refinery has also proved to be an effective method of keeping pollution control objectives before the employees.

In addition, recorded telephone messages containing pollution control suggestions is another type of communication which we have used to good advantage. Any employee may listen to such recorded messages by simply dialing a designated telephone number.

By surveying each processing area of the refinery, it was found that certain chemicals were occasionally discharged into the refinery sewer system. These situations were corrected immediately whenever it was possible to do so by simple means. For example, in several locations at the Light Oil Treating Plant, spent caustic sewer drains were cemented closed to prevent the inadvertent spillage of phenol-bearing caustic into the refinery sewer system. In another instance, a minor piping change eliminated the occasional overflow of spent sulfuric acid into the sewer system. Similarly, a waste caustic stream is now collected and shipped with other spent caustic solutions to one of our Eastern Refineries where it is neutralized for the recovery of chemical byproducts.

Our previous pollution abatement studies had shown that the operation of a sour water stripper should prove very helpful in eliminating certain waste materials. Consequently, capital was budgeted for this facility and the equipment was constructed and put into service in February 1965. This proved to be a major accomplishment in the elimination of chemical pollutants. Use of this facility has virtually eliminated sulfides from our refinery effluent, and has reduced both phenols and ammonia-nitrogen by more than 90 per cent.

Throughout the year special emphasis was placed upon the reduction of waste water flow rates through the API separator, to increase the settling time and thereby improve the efficiency of oil separation. Reuse of process water and reduction of water flow rates were the two basic principles used to achieve our objective. Flow rates through the API separator now average only 1.6 million gallons per day, reflecting a 20 per cent reduction since the March 1965 pollution meeting in Chicago.

My next remarks will deal with:

Item 12 - Development of a Time Schedule for Construction of Necessary Industrial Waste Treatment Facilities

Early in the year 1965 we made a very thorough study of our refinery waste-handling facilities to determine what additional improvements could be made to minimize the discharge of wastes into our sewer system. Many of the improvements suggested by this survey were relatively small projects which would improve our housekeeping capabilities.

From this study two lists of pollution abatement projects were developed. One was a Primary Project List, considered to offer the greatest potential improvements in pollutant reduction. The other was a Secondary List, containing relatively less important projects for possible installation in the year 1966.

MR. STEIN: Pardon me. Let the record indicate that Colonel Chesrow has taken his place at this point. Thank you.

MR. KEIPER: We have completed since the March 4, 1965 conference 13 projects. Three projects are in various stages of completion, and seven additional ones are planned for 1966. All of this work is outlined in some detail in the report.

The list of completed projects is shown in Table 3. Most of these items are self-explanatory, and others have been described in the preceding portion of my report.

Table 4 lists our current schedule of Water Pollution Projects. Item No. 2, "Install Caustic Drips and Drain Collection System at Light Oil Treating Plant" was one of our primary pbojects. Installation of these facilities should virtually eliminate the chance of accidental spillage of phenol-bearing caustic into the refinery sewer system.

Table 5 lists our proposed projects for the year 1966. As some of these projects are still in the planning stages, the list is subject to revision. The broad aim of all of these projects is to improve the quality of the API separator effluent, our major waste stream discharging into the Indiana Harbor Canal.

The information contained in Tables 3, 4 and 5 was forwarded to the Indiana Stream Pollution Control Board attached to our September 30, 1965 letter.

(Tables 3, 4 and 5 follow:)

TABLE 3

COMPLETED WATER POLLUTION ABATEMENT PROJECTS

	PROJECT	COMPLETION DATE
1.	Cleaned east section of API Separator and repaired flight scrapers.	April, 1965
2.	Sealed spent caustic drains to sewer at Light Oil Treating Plant.	April, 1965
3.	Rerouted South Dock Well Point discharge piping to Ballast Tank (this stream was previously routed direct to the canal).	May, 1965
4.	Rerouted Boilerhouse Well Point discharge piping to the API Separator (this stream was previously routed direct to the canal).	May, 1965
5.	Constructed a new sludge pit to permit settling of solids from wash waters.	May, 1965
6.	Modified Crude Desalters to improve separation between water and crude, thus eliminating oil from the API Separator.	May, 1965
7.	Cleaned west section of the API Separator and installed new wooden flight scrapers.	June, 1965
8.	Made piping changes at the Light Oil Treating Plant to allow pumping LPG caustic to the spent caustic tank for shipment instead of draining it to the sewer.	June, 1965
9.	Made piping changes at the Alkylation Unit to allow procedural changes which eliminated occasional spills of sulfuric acid to the sewer.	June, 1965
10.	Installed a dry well at the Flare Knockout Drums for disposal of objectionable drain water.	July, 1965
11.	Installed automatic sampling system on the effluent stream from the API Separator (the previous system was a temporary installation).	August, 1965
12.	Installed a temperature recorder on the effluent stream from the API Separator.	August, 1965
13.	Installed a pH recorder on the effluent stream from the API Separator.	August, 1965

TABLE 4

CURRENT SCHEDULE OF WATER POLLUTION ABATEMENT PROJECTS

PROJECT	STATUS
1. Install flow measurement system on API Separator effluent.	In Progress
2. Install caustic drips and drain collection system at Light Oil Treating Plant.	In Progress
3. Provide system for diverting process vessel wash water from the alkylation Unit to the sludge pit.	In Progress

TABLE 5
PROPOSED
WATER POLLUTION ABATEMENT PROJECTS
FOR 1966

1. INSTALL FLUSHING LINES FROM PROCESS UNITS TO NEW SLUDGE PIT.

2. ELIMINATE FLARE KNOCKOUT DRUM CONDENSATE FROM API SEPARATOR.

3. INSTALL COLLECTION SYSTEM FOR ALKYLATION UNIT ACID SPILLS.

4. ROUTE QUENCHED BOILER BLOWDOWN WATER DIRECT TO CANAL.

5. ROUTE NON-POLLUTED WATER FROM WATER TREATING PLANT AND BUILDING ROOF DRAINS DIRECT TO CANAL, INSTEAD OF THROUGH API SEPARATOR.

6. INSTALL FLOATING TYPE OIL SKIMMER ON THE FILTER SECTION OF THE API SEPARATOR.

7. INSTALL SOLIDS SEPARATION SYSTEM FOR COPPER TREATER EFFLUENT.

Following completion of our current program, I feel our refinery will be in an excellent position with respect to water pollution control.

We have very recently received an abridged report of the technical committee on "Water Quality Criteria, Calumet Area - Lower Lake Michigan." As we have not had sufficient time to study its contents, we should like to reserve judgment on its contents. However, we note that water quality criteria have not yet been established for the Indiana Harbor Canal, into which our effluent discharges. Consequently, we can make no specific determination of our future waste water processing equipment requirements until such criteria are established.

I want to add my comments that I think that the technical committee has done an outstanding job.

Conclusions

The following brief comments summarize Mobil Oil Company's position on the water pollution control problem.

1. Since the March Conference at McCormick Place, we have made the required Refinery Waste Water Quality Surveillance Surveys, and reported the results to the Indiana Stream Pollution Control Board.

E. D. Keiper, Jr.

2. We have established a routine sampling and testing program for our refinery waste streams, reporting analytical results monthly to the Indiana Stream Pollution Control Board.

3. We have diligently studied our refinery waste disposal practices to determine what actions can be taken to minimize the discharge of pollutants into our refinery effluent streams.

4. Many pollution control projects have been planned and several have been completed. Most of these were directed toward improvements in housekeeping practices.

5. Our existing program of employee education and training has been continued and accelerated in the area of giving special emphasis to water pollution control techniques and to the importance of minimizing pollutants in refinery effluent streams.

6. Our effluent water analyses indicate we have reduced the discharge of phenols, ammonia-nitrogen, and sulfides by more than 90 per cent each since the GLIRB Survey of October 30 and 31, 1963.

7. We have received several helpful suggestions from the Indiana Stream Pollution Control Board concerning our waste disposal problems and look forward

to further cooperation with this group on future projects.

They certainly in my opinion have done an outstanding job in this most difficult problem.

8. We shall diligently continue our efforts to meet any reasonable waste water effluent quality standards which may be established from the technical committee's Report on Water Quality Criteria, Calumet Area-Lower Lake Michigan.

That is our report.

I would like to add, Chairman Stein, an observation, and I think it certainly is outstanding and has been mentioned already. I want to compliment you and the conferees and all of those participants so far in this conference, yesterday and today, on the positive attitude that everyone has taken.

I think this is most constructive and helpful. I think it is certainly the way that someone mentioned yesterday we can accomplish almost anything.

Secondly, I would like to add this further consideration in this whole joint effort that all of us are engaged in: That we think not only of abatement of pollution but of conservation of water. I think the two go hand in glove. Maybe there is not a straight-line function where as you reduce the use of water you would also directly proportionally reduce the opportunity or the chances for pollution. But I do think that very definitely the two of them are combined.

On this use I just did a little calculation last night as an example. I assumed between 800,000 and 1,000,000 homes or families and took Chicago as an example. If they saved 50 gallons of water a day, which can easily be done because the average home uses somewhere around 150 to 200 gallons of water a day, believe it or not, you can just see what a tremendous volume each day up in the millions of gallons could be saved.

I think all of us need to be a little more cognizant of this in our everyday life. Maybe we have to train some of our teen-agers to, as well as turning off the lights, also turn off the faucets and not let the shower run for an hour and things like that.

Thank you very much.

MR. STEIN: Thank you, Mr. Keiper, for a very comprehensive and constructive statement.

I might say I would like to join you in your remarks at least from another vantage point -- of an old bureaucrat and public official in the field -- in commenting upon the cooperative attitude of the local governments and States and industry in this problem.

Sometimes you think you have been working in the field a long time and you get into a conference of this kind with the attitudes that have been expressed so far and you think you have reached a millennium.

I think we all want to solve the problem. There might inevitably be differences of opinion on methods or approaches to what we are doing, but I think with the good will and the diligent effort that has been exhibited here we can't but help solve this problem, and I am sure we will.

Are there any comments or questions from the conferees?

Mr. Poston.

MR. POSTON: I am very much impressed with Mr. Keiper's report from the standpoint of his coverage of the various items which the conferees made in their recommendations in the past.

I think perhaps if all industries had been able to show the percentage of reductions that Mobil Refinery has, we would have been able to detect in the rivers more reduction on our part.

I note, for instance, on oils that the surveys showed that Mobil Refinery had about 500 pounds per day in 1963 and it was reduced to 254. This 500 pounds is really a small per cent of the total of somewhere around 100,000 that was coming out of this total river.

MR. KEIPER: Yes.

MR. POSTON: I like also your cooperative attitude, which Mr. Stein commented on. And I have had a number of people inquire, and it seems to be a question that is quite frequently asked in the hall: What are you going to do if they don't? And I think it's way too early to give any consideration to this. As Mr. Stein said, I think most everybody that I have listened to here has a desire to have clean water.

MR. KEIPER: I think so.

MR. POSTON: Thank you.

MR. KEIPER: Thank you.

MR. STEIN: Thank you. Are there any further comments or questions?

I just have one.

You said in the last page of your statement· "Following completion of our current program, I feel our refinery will be in an excellent position with respect to water pollution control."

MR. KEIPER: Yes.

MR. STEIN: Now, in the Indiana report which was given yesterday, in dealing with your plant, Mobil

Oil, East Chicago, they recognized your reductions, but the conclusion of the Indiana people was that additional in-plant control and improved housekeeping practices are needed to eliminate periodically high BOD, suspended solids, oil, phenol and ammonia in the main outfall.

Do you believe when you complete your current program that you will satisfy the requirements of Indiana in this additional work that they want done?

MR. KEIPER: Yes, we do, Mr. Stein.

MR. STEIN: Thank you.

MR. KEIPER: We are very, very optimistic.

MR. STEIN: Right. Thank you very much.

Mr. Poole.

MR. POOLE: Next I am going to introduce Mr. J. W. Kirkpatrick, who is manager of the Chicago District, Youngstown Sheet and Tube Company.

Mr. Kirkpatrick.

James W. Kirkpatrick

STATEMENT OF

JAMES W. KIRKPATRICK,

MANAGER OF CHICAGO DISTRICT OPERATIONS,

THE YOUNGSTOWN SHEET AND TUBE COMPANY

MR. KIRKPATRICK: Mr. Chairman, Conferees, ladies and gentlemen:

My name is James W. Kirkpatrick, and I am Manager of the Chicago District Operations for the Youngstown Sheet and Tube Company.

Our company has an integrated steel plant located in East Chicago, Indiana on the westerly shore of the Indiana Harbor Ship Canal and fronting on Lake Michigan. It has three blast furnaces, a coke plant, 17 open hearth furnaces, and rolling mills, pipe mills, bar mills, sheet and tin mills, and galvanizing lines. We employ an average of 11,000 persons in the district.

Two large water intakes supply process and cooling water to this plant. One is located at the entrance to the Indiana Harbor Ship Canal, within the breakwater; the other is on Lake Michigan. Their combined pumping capacity is 700,000,000 gallons a day, and our present usage is about 400,000,000 gallons per day.

At the conference held in Chicago by the Department of Health, Education, and Welfare in March 1965 our company submitted a report which described our production facilities and waste water control program at this plant. That report set forth considerable detail concerning our past activities and installations for control of our discharges. I will not repeat it here. I would like to review for you now the present status of our program, our accomplishments since March 1965, and our plans and time schedule for future improvements.

MONITORING

First, the program outlined by the State of Indiana for initial monitoring of our sewer outfalls has been completed, and we have submitted the data to the technical secretary of the Stream Pollution Control Board of the State of Indiana. We are also submitting daily analyses of the discharges from our new No. 2 tin mill.

At present we do not have the continuous sampling equipment, the laboratory facilities, or the personnel to carry on the extensive continuing program of plant-wide monitoring data that has been suggested by the State. We have, however, developed a plan which we are about to submit to the State for obtaining this data. It will include the acquisition of equipment, the expansion of our laboratory, and the hiring of competent personnel, and it will outline a timetable for proceeding with the enlarged monitoring program. The data will be submitted to the State.

SEWAGE

Next, as we reported to you in March, all our sewage is connected directly to the East Chicago Sewerage System. None is discharged from our plant to any waterway.

Recent tests made on our sewer outfalls by the Indiana Stream Pollution Control Board have shown some high bacterial counts. To locate the source, we have since then made a detailed survey of all the sanitary facilities and have also resampled not only the sewer outfalls but also the plant water intakes. The results show that the high bacterial counts reported in the outfalls were present in the canal intake and thus, with one minor exception, were attributable to the water coming to us from above our plant in the canal. The minor exception was a single toilet facility which, without our being aware of it, was connected with a plant sewer. This has now been corrected, and dye tests have shown that there is no physical connection from any sanitary facilities to any discharge lines other than to the city sewerage system.

James E. Kirkpatrick

Now, to report on our industrial wastes and the abatement program we have worked out with the State of Indiana: We began our program under State direction nearly 20 years ago and have continued it uninterrupted since the very start. The present activities in which we are engaged, of course, have been greatly expanded since the beginning.

In our program over the next three years it involves expenditures for waste water control estimated at $11,000,000, none of which would be spent except for pollution control.

COKE PLANT

The organic discharges from our by-product coke plant are of concern because of the possibility that sometimes they may be associated with taste and odor problems at nearby public water treatment plants. A program has now been developed to end the discharge.

Our coke plant has a dephenolizer for reduction of the phenolics. It also has an ammonia still for removal of the free ammonia, and lime is added to spring the fixed ammonia. However, the still-waste is presently discharged to the Indiana Harbor Ship Canal.

You will recall that at the March conference the Mayor of East Chicago, the Honorable Dr. John B.

Nicosia, stated his desire to cooperate in solving the pollution problems. He announced his interest in working out arrangements with industry for having the East Chicago Sanitary District handle some of the industrial wastes that are amenable to treatment in the city's treatment plant. Since that time, with the active cooperation of Mr. Cornel A. Leahu, Superintendent of the East Chicago Sanitary District, our company and the Sanitary District have conducted experiments and trial runs which have now established the ability of the Sanitary District Treatment Plant to handle the still-wastes from our Indiana Harbor Coke Plant. As a consequence, we're happy to be able to state that the City of East Chicago has recently executed a contract with us for connection of this waste to the District sewers, to be treated by the District Treatment Plant.

The volume of this waste amounts to approximately 500,000 gallons a day and carries phenolics, chloroform extractable organics, cyanides, and ammonia. Our agreement provides for joint supervision of the material discharged and for controls to prevent interruption of the District Treatment Plant. The waste will continue to be processed through our dephenolizer before being sent to the City system and we will, of course, pay a service charge for the treatment in the City system.

Before the connection can be made, Youngstown will have to undertake some new construction at the coke plant. This will include first, a detention tank for gravity separation of solids, and second, pumping facilities, and a force main for conveying the wastes to the District's sewer. Detailed plans for these changes are being developed, and completion of the construction is expected within 18 months.

Two major changes in processing are also planned. The first is a new naphthalene wash oil scrubber in the gas system, and the second is decanting equipment for recovery of the light oil and caustic washes. The caustic will return to the flushing liquor system, and the light oil to the light oil plant.

These various changes, which will cost about $850,000, will require approximately 24 months for completion. We can now state, therefore, that under this program, in two years there will be no discharges to the waters of the State from our coke plant area, other than uncontaminated cooling water.

BLAST FURNACE AREA

Next, I turn to the blast furnace area, where three blast furnaces are presently located. The gas washer water from these furnaces contains flue dust -- which is essentially an inert, fine, iron oxide with a mixture of coke breeze and limestone. At present this water is clarified in two large settling basins, called thickeners. Over the past several years the company has taken steps to increase the efficiency of this recovery, in part by use of improved washers, and in part by operating procedures for increasing the recovery at the thickeners. An even greater reduction of flue dust has been attributed to the improved technology in burdening a blast furnace. Nevertheless, there is still a residual of flue dust discharged to the Indiana Harbor Ship Canal.

But we are taking steps to eliminate this. Since the conference last March, Youngstown has announced a new construction program at the Indiana Harbor works which will include a fourth blast furnace. It will have facilities for recycling its gas washer water in a closed system. Of importance here is the fact that when the recycling is applied to the new furnace, the existing three furnaces will be modified to permit their inclusion in the recycling system as well. This will eliminate the discharge of all gas washer waste waters from the blast furnace area. Upon completion of this work, therefore, there will be no further discharge of flue dust from our plant. Engineering is partially completed. The cost of the waste water control portion of this new construction will be some $2,500,000, and completion will require about three years. Meanwhile, operation of the existing standard flue dust clarifiers will continue.

We are happy to be able to state that this recycling will remove the major source of solids discharge from our entire plant. At present this source amounts to some 27,000 pounds a day of flue dust when three furnaces are in operation.

ROLLING MILLS

The other principal source of solids discharge is found at the various rolling mills. Some roll the steel while it's hot, others after it's cold. Actually, there are four types of wastes from the rolling operations: Solids, oil, acid, and chemicals from plating. I'll review our program on each of these separately.

(a) Solids

First, the solids. These are inert particles of steel called mill scale. The following mills are involved:

(1) Old Hot Strip Mill

The old hot strip mill utilizes a large-scale

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pit and recycles about one-fifth of the water used on the mill. All of the large and most of the fine scale is removed in the pit. What isn't recovered by this process is very fine, indeed, and is discharged to the ship canal.

However, we plan to eliminate even these discharges, as a result of the company's announced expansion program which contemplates phasing out the operation of this mill following completion of a new larger hot strip mill now under construction. The new mill is scheduled for completion in 1968 and will have adequate facilities for recovery of both mill scale and oil.

(2) Buttweld Pipe Mill

A second hot rolling mill is the buttweld pipe mill. At the time of the March conference, a sewer carrying solids amounting to some 6,000 pounds a day discharged from this mill to the canal. Since then this waste has been diverted to a large, efficient scale pit in the turning basin area.

The remaining waste now discharged direct to the canal is scheduled to be diverted to this scale pit for secondary treatment. Completion is scheduled for 1968 and construction will coincide with the flue dust program.

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(3) Primary Mills and Related Secondary Hot Rolling Mills.

Next are the primary mills, consisting of two blooming mills and the secondary rolling mills, including bar and billet mills, merchant mills, skelp mills and a second buttweld pipe mill.

As reported at the March conference, a scale originating at these mills receives primary settling at the mills, and then secondary settling in the large, efficient scale pit at the turning basin area. This is a truly modern pit, 110 feet long, 43 feet wide, and 29-1/2 feet deep. The waters leaving this pit are discharged into the turning basin. The residual scale which they retain is very fine, and its concentration very low. The net discharge averages less than 50 parts per million of solids.

(4) Lakefront Development - Secondary Hot Rolling Mills.

Expansion of our plant in the past several years has proceeded largely on riparian lands at our lakefront and includes a seamless pipe mill and sheet mill, both of which are in operation, and a hot strip mill currently under construction.

Process water from these mills, carrying scale, receives primary and secondary treatment and then is discharged to a lagoon within the boundaries of our breakwater. It is then recycled through the aforementioned mills.

Though planned and under construction long before the March conference, the lagoon has been completed since that time. It already accepts the discharges from the new cold reduced mill and also the discharge from the seamless tube mill area. Other connections to the recycling system will be made as our planned expansion develops.

(b) Oil

I come now to what is one of the most difficult of all discharges to control. This is oil. The principal sources are from our rolling mills.

(1) Old Hot Strip Mill

As we reported in March, the old hot strip mill accounted for about half of all the oil loss in the entire plant. Oil recovery from the new scale basin installed at that mill in 1957 was not effective. The oil loss was such a problem that we had already undertaken, prior to the March conference, to install the continuous oil recovery facilities we described to you at that time. Since then, this installation has been completed and is now fully effective. Also, spare recovery facilities have been ordered to that maintenance difficulties will not necessitate bypassing the recovery equipment. Thus, over half the oil discharge that was occurring at our plant last March has now been eliminated.

(2) Large Secondary Scale Basin

At the large secondary scale pit in the turning basin area, which I have already mentioned, we have completed plans for additional oil recovery facilities. These will consist of a second oil recovery belt scheduled for operation by March of this year. Experimental work is also under way to determine whether modification of the baffling of the pit will provide more effective oil separation.

(3) New Cold Mill

At the cold rolling mill recently completed on the land-fill area, we have included facilities for oil emulsion breaking and separation. The resulting discharge, together with the drainage from sumps in the mill, goes to a lagoon which traps any residual oil from this mill.

(4) Oil from Tin Mills and Other Cold Rolling Operations

The waste waters from the tin mills and other cold rolling operations are discharged to the canal. Oil from these sources originates either as rolling oil solutions or accumulations in sumps, drippage or leakage. The rolling oil solutions are collected and hauled by truck to disposal. We are now developing a detailed plan for collection and disposal of all sump drainage, because our recent survey data showed high oil concentrations at the sewer outfalls at times when the sump pumps operate. A very large area is involved, and completion of the facilities for collection of oil from all these sumps is expected to take some 36 months.

(c) Acid

I come now to the acid disposal problem. As we noted in our report in March, Youngstown has been hauling acid from five operations to the slag disposal area for neutralization on the hot slag. This program, started in 1950, has been augmented now with plans for a collection system at the only other remaining acid discharges. These are two units which together discharge about 20,700 pounds of acid a day and about 3,600 pounds of oil. The facilities for interception and collection of both acid and oil from these two units is scheduled in steps: 18 months for the first unit, and an additional 12 months for the second unit.

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(d) Metal Finishing

On handling metal finishing wastes, Youngstown has complied with State requirements, and the record of control submitted to the State indicates adequacy.

Youngstown's new tin mill, completed in 1957, included effective controls approved by the State for preventing any discharge of acid or plating wastes. There are intercepting sumps and the wastes are then pumped to holding tanks, from which they are hauled away to a disposal site.

CRITERIA OF WATER QUALITY

Before summarizing, I would like to refer to the report of water quality criteria proposed by the technical committee appointed at the conference in March. This report reached us only last Wednesday. Obviously there has not been time for us to evaluate it. We would very much like to have the opportunity to give you our comments after we have been able to review and analyze the proposals.

SUMMARY

Let me now summarize. There is no discharge of any sanitary wastes. All go to the East Chicago city system.

As to the coke plant wastes, the City of East Chicago Sanitary District has now contracted with us to take the still-wastes into the District sewage treatment system. This will eliminate their discharge to the Ship Canal. Major changes will be made in the coke plant processing facilities to eliminate the possibility of other waste discharges. Expected time of completion is 24 months for all of these facilities.

The oil recovery facilities installed at the hot strip mill since the March conference have eliminated half the entire oil loss at the Harbor plant. Plans to control the other oil losses are outlined, and completion is estimated in 36 months. This will be a continuing program, done in steps, so there will be reductions as the program proceeds.

The program for collection of pickling acids requires facilities at two units, the only two not already fully controlled. These will be completed in 18 months for the first, and an additional 12 months for the second.

The major source of solids is the blast furnace area. Plans are in preparation now for recycling the blast furnace gas washer water from the existing three furnaces in conjunction with a fourth furnace to be constructed. This will eliminate all flue dust discharge. The program is expected to be completed within three years.

The planned expansion of the lakefront facilities is in an area where, through construction of a large lagoon inside the breakwater, we have provided for recycling of process and cooling water and consequent elimination of discharges to Lake Michigan.

Thus, in summary, there has been significant reduction in oils and solids at our Indiana Harbor plant since the March conference. In addition, in our effort to provide fully effective controls on the remaining waste-water discharges, we are undertaking a three-year program which will involve expenditures estimated at $11,000,000, exclusive of operating costs. Of this amount $6,000,000 is for waste-water controls with which we are equipping new plant facilities presently under construction. All the expenditures are programmed solely for control facilities and offer no increase in productivity. We believe they reflect some measure of this company's effort to do its part toward improving the waters of the area.

MR. STEIN: Thank you very much for a very comprehensive report, Mr. Kirkpatrick.

Are there any comments or questions?

Mr. Klassen.

MR. KLASSEN: Mr. Chairman, in March I was quite critical of the presentation by this company, and I think I even made such remarks as they were standing watching the parade go by.

I am very happy now, in reviewing this, to say that they are not only in the parade, but, from what I have heard so far, they are the head of it. I just want to say that as a conferee this is the kind of progress we have been looking for, and I appreciate the presentation that was made here by this company.

MR. STEIN: Thank you.

Mr. Poston.

MR. POSTON: I was going to make a similar comment of how well I thought Mr. Kirkpatrick's report was organized, in a logical manner, and it was easy for me to see that you recognize your problems.

I can see from your report some of the plans that you have made to accomplish the abatement.

I do have one question that I would like to ask, and it concerns the $11,000,000 that you plan to spend for abatement work.

I know that you have, along with others in that area, extensive air pollution problems. I wondered whether this $11,000,000 is concerned entirely with water pollution problems.

MR. KIRKPATRICK: I can answer that very quickly for you. Over the past two years we have spent approximately $2,000,000 on air pollution abatement. We have a program for next year, the year 1966, of another $2.5 million, which includes some water-treating facilities for completely enclosed cycling in the air pollution abatement. But those monies are not included in these figures. They are solely tied in to our air pollution abatement commitment monies and not tied in with water pollution abatement.

MR. STEIN: Any further comments or questions?

Mr. Kirkpatrick, I have one or two. This is for the purpose of clarification. Possibly the Indiana people might want to look at this.

I am a little confused on the dates. Perhaps we are talking about the same thing, and I don't know that you are very far apart, but at least the record indicates enough of a disparity that I think it might be worthwhile to look at this.

In the Indiana report they indicated that you have concentrations of BOD, suspended solids, oil, ammonia-nitrogen and phenols in significant amounts. They also indicated your program to correct those, and they said, "This program is to be completed within 30 months. Adequate waste treatment facilities must be installed."

I think you did give an abundantly clear report of what you are going to do. However, several of your commitments or analyses have indicated that you would complete it in 36 months, three years, not 30 months.

Now, is there any disparity between you and Indiana?

MR. KIRKPATRICK: I would not like to make a positive statement at this time, but I believe that what the State of Indiana has done is subtracted some time from the time that was originally proposed to them until the date of this conference.

As far as I can say right now, we are going very much by the presentation. However, I would like to check further with other principals.

MR. STEIN: I think on the record it indicates possibly there may be some disparity in time.

By the way, I don't think the question of the six months' apparent difference cannot be adjusted.

MR. KIRKPATRICK: As I say, I think perhaps the discrepancy is that the original presentation was made the 31st of August to the Indiana people and this presentation has been made today.

MR. STEIN: Now, then, here is one more point. When you talk about the buttweld piping, you say, concerning the second hot rolling mill, "The remaining waste now discharged direct to the canal is scheduled to be diverted to this scale pit for secondary treatment. Completion is scheduled for 1968 and construction will coincide with the flue dust program."

Now, as I read a couple of pages in advance, you say, "Upon completion of this work, therefore, there will be no further discharge of flue dust from our plant. Engineering is partially completed. The cost of the waste-water control portion of this new construction will be some $2,500,000, and completion will require about three years."

Now, if you are going to complete it in 1968 and coincide it with the flue dust program, will this be coincided to a two- or three-year program?

By the way, I am asking these questions for purposes of clarification and understanding your position and not critically.

MR. KIRKPATRICK: I think this particular discharge compared to the overall flue dust discharge is a relatively minor discharge, and it happens to be tied in with the same sewer system as the blast furnace flue dust discharge system.

So it would coincide at the time that the blast furnace flue dust system is consummated. In other words, there would be diversionary sewers made at that time to the lakefront scale pit.

MR. STEIN: I wonder too if you could give us some clarification on the old hot strip mill. The indication is that you did put in facilities to deal with your oil losses and that the installation is completed and full effective. But the next sentence says:

"Also, spare recovery facilities have been ordered so that maintenance difficulties will not necessitate bypassing the recovery equipment."

I assume you probably have maintenance problems from time to time.

MR. KIRKPATRICK: I think that you can appreciate these things don't last forever.

MR. STEIN: That's right.

MR. KIRKPATRICK: Like anybody else, we try to run a maintenance setup where we do this on anticipating trouble rather than waiting for trouble to occur.

MR. STEIN: Right.

The question I had to ask is: Can you give us any estimate as to when you expect these spare parts or facilities to come which would preclude the necessity of bypassing?

MR. KIRKPATRICK: For all practical purposes I think that we have them right now.

MR. STEIN: Thank you.

Are there any further questions or comments?

(No response.)

If not, I too want to commend you on the very concise and clear and detailed presentation in this report.

Thank you very much.

MR. KIRKPATRICK: Thank you, gentlemen.

MR. STEIN: Mr. Poole.

MR. POOLE: I would like to introduce Mr. Ross Harbaugh, who is Assistant to the Vice President of Inland Steel Company, for a report on Inland's activities.

STATEMENT OF
ROSS HARBAUGH,
ASSISTANT TO THE VICE PRESIDENT,
INLAND STEEL COMPANY,
EAST CHICAGO, INDIANA

MR. HARBAUGH: I am Ross Harbaugh, here representing Inland Steel Company. We appreciate the opportunity to express our views on this important matter of control of pollution of area waters.

The invitation to appear, from Mr. Poole of the Indiana Stream Pollution Control Board, stated that this is to be a technical session of the conference. The invitation requested that Inland present its program to comply with the recommendations issued in the summary of the March conference by the Secretary of Health, Education, and Welfare. We are invited also to comment on the recommendations of the technical committee established by the conferees following the March session.

Status of the Inland Program

As the first subject of my report, I will describe our activities and accomplishments since the March meeting and indicate the general nature of our plans for the future. In March our statement pointed out that Inland had a pollution control program in being

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which included "expanded laboratory facilities, enlarged technical force, an in-plant housekeeping and reporting system. . . , new and improved treatment facilities." The statement listed five new treatment facilities which were under construction.

The March presentation discussed at some length our treatment of sanitary sewage, concluding that we considered this phase of the overall pollution problem to be under control.

However, constant surveillance is necessary to insure that control is maintained. In the preliminary sanitary survey carried out by the State Board in September, four of the outfalls showed minor contamination from sanitary sewage, the highest MPN B. Coli reported being 23,000 per 100 ml. Even though this is not a high number for effluent streams, action was taken to find and eliminate the source. As pointed out in the previous report, we do chlorinate sanitary plant effluents. This is in conformance with the recommendations.

Since the March meeting the major new installation then under construction has been placed in operation. This is the nine-and-one-half million dollar waste-water treatment works serving the 80" hot strip mill. We are most happy that its performance has

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exceeded our expectations, turning out an effluent of very high quality. A paper describing this plant, its operation and performance, was presented by T. F. Voges of our company at the Indiana Water Pollution Control Association meeting in Indianapolis on November 16, and we will make copies available to any who wish to have more detail.

Our in-plant housekeeping and reporting program is continuing. At least one man in each operating department and in cases of larger departments two or three have been designated as the pollution control supervisors. These people are members of plant management who have the specific responsibility of maintaining our ongoing housekeeping program, in addition to conducting surveys aimed at identifying internal sources of pollution. Cases may be cited where their activities have been most effective. A significant example was elimination of the loss of an estimated 200,000 gallons per year of heavy fuel oil in one group of hot rolling mills.

In April, by agreement with a representative of the Indiana State Board, we carried out a survey of sampling and analysis of all of our 21 effluent streams, for 20 different pollution parameters. This survey covered three 24-hour periods and involved some 12 to 1400 individual analyses. Our present routine control analyses total about 2,600 determinations each month and are carried out on a seven-day per week basis. This is in conformance with recommendations, but we look forward to a drastic reduction as programs can be developed which will be effective in insuring proper information and control.

Using the results so obtained in April as the basis for comparison with subsequent analyses which are reported to the State Board each month, we are able to chart progress to date. Latest available data in December 1965 show the following reductions from the April base figures:

Suspended Solids	43 per cent reduction
Cyanide	90 per cent reduction
Ammonia	53 per cent reduction
Phenols	73 per cent reduction.

The reduction in discharged phenols is due in substantial measure to the fact that phenol-containing coke plant wastes are now being accepted for treatment in the sewage disposal plant operated by the City of East Chicago Sanitary District.

In December, following a three-month period during which the city and the company cooperated in a closely observed and technically evaluated experimental program, a formal agreement for city acceptance of these wastes was signed by city and company officials.

We wish to acknowledge the cooperation of Mayor Nicosia and Superintendent Leahu, and the Sanitary Board, in the development of this progressive and positive action.

In July the Inland Board of Directors authorized an expenditure of $385,000 for expansion and modernization of an existing facility for oil and solids separation. This should be completed by the end of 1966.

The disposal of waste acid has been complicated by the widespread interest in the use of hydrochloric acid as a substitute for sulfuric acid for pickling in the steel industry. Although the use of hydrochloric acid greatly reduces the amount of free acid and reduces the iron content to a lesser extent, the spent solution still poses a problem. For the last year we have investigated the advantages and disadvantages of each acid, all of the recovery, regeneration and disposal methods available, and the several combinations which might be suitable for our particular situation. Since we must provide for the use of both acids, in December we reached a decision that in our location and for our situation

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deep well disposal offers the only complete solution.

Engineering is proceeding as rapidly as possible with detailed plans for submission to the Indiana State Board. This problem of pickle liquor disposal, which is objectionable primarily because of water discoloration, will then be solved completely.

We have been conducting and are continuing detailed point-by-point studies of possible pollution sources in blast furnaces, coke plants, and rolling and processing departments. Where possible, losses of pollutants to the sewer systems are corrected immediately and at the source. Where, due to lack of space or due to the need for radical change, immediate solution is impossible, engineering projects aimed at providing a solution are initiated. Seventeen such projects are active and are being carried to conclusion as rapidly as possible.

These 17 projects include the following:

1. Final detailed engineering on the authorized north end oil and solids separation facility improvement. This is to be presented to the State Board within the next two weeks.

2. New pumps and controls at the blast

furnace thickener installation to prevent possible bypassing of the thickeners.

3. Oil skimmers and recovery units at the 14" Mill, 44" Mill, 76" Mill and No. 3 Blooming Mill.

4. Increased capacity and modernization of final cooler recirculating systems at the two coke plants, with provision for treatment of necessary blowdown from the systems.

5. Housing, power, and permanent installation for seven additional 24-hour/day automatic samplers now on order.

6. Three separate projects on phases of the acid disposal plant.

7. Three projects involving additional oil and solids collection in the turning basin area.

It is interesting to find that our program existing in March had anticipated in large measure the recommendations of the conferees and that no abrupt change in direction nor change in objectives was indicated.

We believe that our program insures steady improvement and that regulatory agencies and the public may be comfortable in the knowledge that the quality of water supply as it is affected by Inland, good as it is, is getting better.

Recommendations of the Technical Committee

I should like now to comment on the recommendations of the technical committee. I appreciate very much my appointment by the conferees as an alternate member of this committee. Because Dr. Bishop faithfully attended the meetings, my role was usually that of observer. I appreciate also the opportunity to have the Inland Steel Chemical Laboratory participate in the cooperative studies of methods, and the accuracy and precision which may be expected from different laboratories analyzing identical samples.

No one who observed, as I did, the day-to-day and week-to-week efforts of this committee could doubt the application, the earnestness, and the integrity of its members. To Mr. F. W. Kittrell of the Department of Health, Education, and Welfare, the Chairman, I would pay special tribute. His very difficult task was carried out with unfailing courtesy, steadfastness, and honesty.

Because I am impressed by the professional stature of the members of this technical committee, I am sure there must be an adequate and compelling reason for the withholding of the complete committee report, and for the publishing of an adaptation.

Whatever this reason may be, there is in the published report a lack of emphasis which I must comment upon. This is touched upon on page six and again on page 22. On page six there appears this sentence: "Successful application of the criteria requires that analytical results be reproducible among the several laboratories involved in the program."

On page 22 this sentence appears: "Recent discovery of wide variations in ammonia results obtained by four laboratories on two samples has cast some doubt on the comparability of analytical results."

This last sentence refers specifically to preliminary work done by a subcommittee consisting of laboratory directors of involved agencies and industries. Following this discovery, further work was done on other identical samples, analyzed for other critical constituents.

The work by the subcommittee of laboratory directors has cast serious doubt on the reliability of analytical data, which inescapably was used and must be used, in setting up and monitoring this abatement program.

It is a matter of fact -- not my own or any other's opinion, but fact -- that for these several constituents, ammonia nitrogen, phosphate, phenol, cyanide and threshold odor, available analytical methods do not have the necessary sensitivity or accuracy at the low levels proposed as criteria. Therefore, neither the governmental agencies nor the industries so vitally interested here have the tools to monitor an abatement program based on these criteria. This is known and recognized by those Public Health Service personnel closest to the problem.

Of still greater importance is the realization that dependence cannot be placed upon the analytical data which the committee perforce used in arriving at these criteria. This situation I believe results only from the inadequate time allowed for the technical committee to do its work. Had more time been available, it is entirely possible that more realistic criteria would have resulted.

No one need be, nor indeed should be, embarrassed about this. The Inland laboratory, which I directed for many years, is I believe a competent organization. Many, many times we have faced similar situations in which methods available were not adequate for new requirements. When faced with this problem we did the obvious thing --

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set out to find or develop a method which would meet the need. So shall we all have to do in the present situation.

It is gratifying to all of us that our water supply here in Chicago is of such high quality that we must develop more sensitive and more accurate means of determining the impurities.

My comments are meant to be constructive. Therefore, I would offer some definite recommendations:

1. That the appropriate laboratory of the Department of Health, Education, and Welfare, with the cooperation of involved laboratories of other agencies and industries, carry out whatever research and investigations are necessary to develop needed methods, and to establish not only their reproducibility but also their accuracy and precision.
2. That adoption of those criteria which are dependent upon accurate determination of chemical constituents be held in abeyance until this work is completed.
3. That it be recognized that no crisis exists which should force hasty action on these items, and that time be taken for completion of the Great Lakes-Illinois River Basins Project, and

a calm appraisal of the project's report. Certainly, full advantage should be taken of the tremendous wealth of data developed over the past four years at a cost of some millions of dollars.

In conclusion, we must admit that this conference has accomplished much that is good. There has been an improvement in water quality, apparent both visually and by test. But more important for the long range, there now exists a better spirit of cooperation between industry and city, State and Federal agencies. It is recognized that maintenance of water quality is the responsibility of all.

Thank you.

MR. STEIN: Thank you, Mr. Harbaugh, for the complete and frank expression of your views that we always get. I think they will be of immeasurable value to the conferees.

Are there any comments or questions?

Mr. Klassen.

MR. KLASSEN: Mr. Chairman, I would just like to make a passing comment. It may be on or off the record. It isn't in a particularly facetious vein.

But one of the things out of the presentations yesterday by U.S. Steel and now by Inland I think tucked away in both of these from my own standpoint is an item of interest -- that apparently costs of water pollution control are not going to be involved in this question of increase in steel prices.

We saw yesterday the tremendous job that U. S. Steel is doing with all their construction without -- so far as this morning -- an increase in cost of steel.

And this morning we saw the real job that Inland is doing.

I think maybe one counterbalances another, and while it is not part of our job here to enter into this, I think that from my standpoint I was glad to see that apparently this cost of water pollution is not going to become involved in a national issue.

MR. STEIN: Any further comments or questions?

MR. POSTON: I might comment that in the HEW presentation among the recommendations was one that said that laboratories should continue to work together in a long-range program to obtain uniformity in methods and precision of results, and that industrial and municipal and regulatory agency laboratories are invited to cooperate with the Department of Health, Education, and Welfare in this program.

I think we have recognized the need here, just as we have recognized that the waters in this area are polluted and that something needs to be done.

MR. HARBAUGH: May I comment on this a little more?

MR. STEIN: Yes.

MR. HARBAUGH: I know that the HEW people, the Public Health Service people, are well aware of this difficulty. As a matter of fact, their own laboratory director has been closer to it than perhaps any of us.

I think the point has not been emphasized enough that the same discrepancies which cast doubt on present analyses apply to those data which can be used in establishing a very low level on some other project.

So I think we should review the work done previously to see whether these criteria are close to being right.

This is no quarrel with the way it was done and certainly no quarrel with the work of the committee.

MR. STEIN: Are there any further comments or questions?

I don't know, Mr. Harbaugh. I certainly appreciate your view. But I think we have to really face the kind of problem we have that you have raised, because

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I think increasingly in water pollution control we are going to face that throughout the country.

You point to the statement, "Recent discovery of wide variations in ammonia results obtained by four laboratories on two samples has cast some doubt on the comparability of analytical results." I would say on its face that may cast a doubt on the ammonia analyses. I don't know if it casts doubt on any other of the analyses in the area.

But I think your general point is well taken. If we are going to preserve water quality and get to dealing with elements other than the traditional ones we have been dealing with all these years, oxygen, coliforms, we are going to run into those problems.

I used to say through the years that if the water did not have a high coliform count or an oxygen sag it wasn't polluted. And, of course, we are getting to the more sensitive elements now, and we have this not only in this area, but in various other areas of the country we are going to face the same problem.

The problem is that when you are measuring minute elements on quantities of material such as phenols or threshold odors or hydrocarbons or something of that kind, there is necessarily involved in this a new technique, or a relatively new technique, and there develops some kind of controversy and legitimate controversy about the accuracy of the results or the accuracy of measurement in the area.

This is always a question that we particularly face in our Department, and I think the Food and Drug Administration as well, on the so-called zero tolerance. What do you mean by zero? How close can you measure? If you can't measure more than, say, five parts per million, can you put anything down below five parts per million to zero tolerance?

We have found this happens when you deal with a particular poison, for example, and you come up with five parts per million that we can measure. If our tests don't show it exists, it passes, say, for zero.

Then, suddenly, some bright guy in the laboratory comes up with some notion, and instead of five parts per million he finds a device that can measure down to five parts per billion or even five parts per trillion. Then we take the same stuff that we were passing on before, because we couldn't find it in the measurement, and find the trace. We have the zero tolerance, so you can't ship it in interstate commerce.

We run into this problem all the time. But I

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do think if we are going to protect the waters of the Great Lakes particularly, or protect our rivers and streams and protect the environment, this is a constant problem that the Administrator is going to have to face up to -- what kind of criteria, using the widest gamut of substances, we can put forth in an operational way and when we can do it.

On the one hand, we can always say, "We need further study. We need further analyses. We have to sharpen our criteria." I say this not in any deprecatory way, but when we have gone out with a research project and gone to a university or laboratory, I have always found that one of the recommendations that has come back is that what you need in addition to all the findings is another and bigger study program and research program. I guess it's a built-in "Parkinson's Law" of research. It never ends.

But I think if we are going to deal with clean water or clean food or clean air, as you deal with your product, there must come a time when you go into operation and production. You can't be studying this thing forever.

Now, recognizing points on both sides, I think it behooves us to make a judgment. I think this is particularly important with the Great Lakes, because in dealing with the Lakes if we use our time in research and don't come up with operating criteria,we may find it's too late.

Lake Erie is not in very good shape right now. I don't think we can wait. I think we have to come up with an operating program.

I think we are all going to be faced in water pollution control with making the kind of delicate tests on new frontiers of science in many, many different scientific areas that we haven't been faced with before. I think this is a continuous, nagging problem that we are going to have to live with.

By the way, I think in this area, as you probably have known by reputation or by hearing Mr. Harbaugh, Mr. Harbaugh is one of the Nation's foremost experts.

Thank you very much.

Mr. Poole.

MR. POOLE: I now want to introduce Mr. A. B. Burns, Plant Manager of the Union Carbide Corporation, Chemicals Division, in Whiting, Indiana.

Mr. Burns.

Bruce Burns

STATEMENT OF

BRUCE BURNS, MANAGER, CHEMICALS DIVISION PLANT, UNION CARBIDE CORPORATION, WHITING, INDIANA

MR. BURNS: Mr. Chairman, Conferees, ladies and gentlemen:

My name is Bruce Burns. I am Manager of the Chemicals Division Plant of the Union Carbide Corporation located in Whiting and East Chicago, Indiana.

We manufacture chemicals and plastics through the use of refinery gases and LPG (liquefied petroleum gas) as raw materials. The products we sell are ethylene glycol, "Prestone" Anti-freeze, isopropyl alcohol, acetone, ketone solvents and polyethylene resins. The plant employs about 540 people, and operates on a 24-hour day, seven-day per week basis. Cooling water is pumped from Lake Michigan and, after use, is returned to the Lake with a very small discharge to the Indiana Harbor Canal. No sanitary sewage is discharged to Lake Michigan as these wastes are pumped into the municipal system of the City of Whiting.

The Whiting plant discharges approximately 43,000,000 gallons per day of water to its outfalls. This water has been used for cooling and steam generation. Almost all of the materials now present in the effluent are water-soluble organic chemicals that are mild-smelling, readily biodegradable and present in very low concentrations.

Since last March, the Whiting plant has greatly intensified efforts to reduce the level of contaminants discharged to the Lake.

Our analytical program has been stepped up. Daily composite samples of the fresh water inlet and the effluent waters have been analyzed by our laboratory. Results of these analyses have been reported to the Stream Pollution Control Board of the State of Indiana and have been utilized to continually assess the progress of our abatement program. Duplicate samples are periodically sent to other laboratories for analysis to insure reasonable laboratory-to-laboratory reproducibility.

Our basic program has been and is to eliminate contamination at its source -- to prevent process chemicals from entering the cooling water streams. Such a program must recognize the importance of both the physical facilities in the plant and the people who operate these facilities. During recent months this program has been very effective.

This past year many changes and additions to plant facilities have been made for the purpose of eliminating sources of pollution. A continuous filter was installed and extensive sewer revisions were made to provide permanent facilities to remove all polyethylene resin pellets from our outfalls. These changes were designed to service not only the existing manufacturing plant, but also the additional polyethylene production capacity that is now under construction. At a number of locations drain line systems have been provided to collect the oil leakage from lubricated equipment. Tanks have been relocated and installed at strategic locations to collect concentrated liquid wastes for subsequent use as fuel in the boilers. A 20,000-gallon decanter tank has been provided to remove the settleable and suspended solids from the power plant water-treating operations. The installation of traps at appropriate points has permitted the removal and collection of oil.

We have made a very large number of process changes throughout all of our gas, chemical and resin manufacturing operations to reduce the formation or discharge of pollutants. In many instances this has meant increases in production costs.

We credit a large measure of our success to date to the cooperation and help of all our employees. Pollution abatement is a line responsibility and our people understand that this is as important a part of their work assignments as are safety, production, and costs. Through intensified communication and training we have kept each employee aware that concern for pollution is a very important part of his job. As a result of this, former spillages and flushings to the plant sewer are now either eliminated or minimized, and operation of pollution abatement facilities is maintained at a high level of efficiency. Many ingenious ways to eliminate contamination at its source originate as a result of this continued plant-wide emphasis upon pollution.

As a result of these actions that I have just mentioned, the wastes discharged from the plant, as measured by BOD, have been reduced approximately 80 per cent during 1965. At the time of the conference last March the HEW report indicated a plant load equivalent to 16,500 lb/day of BOD_5. The average load for November and December of 1965 is down to 3,300 lb/day. This is a most significant reduction.

Our immediate plans for the future are to continue the high level of activity that has been so effective to date. In addition, in the next few months we shall install instrumentation as part of an experimental program to monitor the concentration of organic material in our sewers; this should be very useful for detecting leaks and spillages at an early stage. In the first half of 1966 we will provide new facilities in our major processing area to trap, collect, and store oils and materials with taste and odor characteristics.

We expect that this continuing program that I have just described will permit maintenance of an effluent quality more than adequate to satisfy anticipated requirements.

In regard to the technical committee's report on water criteria, we wish to reserve the right to comment in the near future. A little more time will be required in order that we may give the report the study it warrants.

Thank you.

MR. STEIN: Thank you, Mr. Burns, for a very excellent statement.

Are there any comments or questions?

MR. POSTON: I would like to ask Mr. Burns about the polyethylene pellets that they will recover and whether or not this will result in a savings to his company in the fact that they are able to retain these.

I have had quite a bit of interest in these pellets because of the wide incidence of their occurrence around the Lake. I'm not sure that they are all from your particular plant, but this is the only one that I know of.

MR. BURNS: Actually within our plant the collection of these pellets is a recovery of material, but in going through our sewer system they become contaminated enough so that they are not readily saleable as a prime material.

MR. POSTON: That's all I have. I appreciate your report, and I think that you have covered many of the points of interest to me. Thank you.

MR. BURNS: Thank you.

MR. STEIN: Any further comments or questions?

(No response.)

If not, thank you very much, Mr. Burns.

MR. STEIN: Here is, I think, what we plan to do today. We very well may be moving ahead of schedule. But there are two more people planned from Indiana, and at that time we may recess for lunch and then hear from Mr. Klassen and Colonel Chesrow.

Then, if we are finished early enough this afternoon, the conferees can go into executive session, and we may have some sort of an announcement for you this afternoon depending on the schedule.

Now, hopefully, we can push this along, and if we can wind up one day in advance of the expected schedule so much the better. Let's see if we can do it.

By the way, let me make this clear. I didn't realize this. Colonel, do you have four or five people to call?

COLONEL CHESROW: I have five, yes.

MR. STEIN: If this is the case, we may have the conferee announcement tomorrow morning rather than this afternoon. But let's see how we proceed.

Mr. Poole.

MR. POOLE: I want to introduce Mr. Russell C. Mallatt, who is a member of the technical committee that has been discussed so much here in the last two days. He represents American Oil Company of Whiting, Indiana.

MR. STEIN: Mr. Mallatt, just before you start, let me do this so we can again give you the information on the recomputation of time here. I always try to do this as we go on. It now appears that we very well may have the public session all through today and the conferees will not be able to get together until later this evening. So we very well may have an announcement tomorrow.

Mr. Mallatt.

Russell C. Mallatt

STATEMENT OF

RUSSELL C. MALLATT, COORDINATOR OF AIR AND WATER CONSERVATION, AMERICAN OIL COMPANY,

WHITING, INDIANA

MR. MALLATT: Distinguished Conferees, ladies and gentlemen:

My name is Russell C. Mallatt, and I represent the American Oil Company.

Mr. Chairman, I ask to have the statement made a part of the record.

MR. STEIN: Without objection this will be entered in the record as if read.

MR. MALLATT: When I spoke at the first session of this conference I summarized our company's program to improve the quality of effluent water from our refinery at Whiting, Indiana. At that time I was technical service superintendent of the Whiting refinery. I spoke also on behalf of the Calumet Nitrogen Products plant at Hammond, Indiana.

Since then I have been named to a newly-established position with American Oil -- Coordinator of Air and Water Conservation.

What I will do today is tell you about the things we have done in the past six months -- at both

Russell C. Mallatt

plants -- to provide additional protection for Lake Michigan. I'll also look briefly at some possibilities for the future.

I'd like first, if I may, to review quickly the Whiting refinery's effluent-treating facilities that we discussed in detail last March. Whiting's system, one of the most extensive of any refinery in the country, includes these main points:

Process water, cooling water, and sanitary sewage are each handled separately. We have complete segregation.

Both process and cooling water are treated in oil-water separators of American Petroleum Institute design.

Process water is also subjected to bio-flotation treatment. This process is a product of our own research.

Sludges are de-oiled and de-watered by centrifugation.

Emulsions are resolved by two-step treating.

Sanitary sewage is routed to the Hammond Sanitary District, where it is treated by the activated sludge process.

Spent caustic, spent acids, and other treating chemicals are disposed of separately.

Russell C. Mallatt

And refinery maintains large-scale in-plant monitoring and good housekeeping measures.

So much for my review of basic facilities.

We have made further improvements in the past six months, and I'm pleased to report that these have brought positive results. Since our spent cooling water is already of adequate quality, we have concentrated on our treatment of process water. Our approach has been to reduce the load on the process-water treating facilities in two ways: One, to remove some selected components from the stream before it reaches the facilities; and two, to provide additional oxygen input to the bio-flotation process. Besides these improvements we have also increased our housekeeping efforts within the plant through management action and an effective employee awareness program.

Now let's look at the specifics, beginning in April.

On April 11 we brought on stream a new lubricating oil hydrogen-treating unit. Shortly afterward we shut down the acid and clay treating section of a large de-waxing plant. This process change is significant because it eliminated a source of substantial amounts of clay that formerly entered our process-water collecting system. The clay had acted as an emulsifying agent and had tended to keep our oil-water separators from working at top efficiency.

Also in April we launched a preventive action campaign among employees. Our aim is to make them aware of the need to do everything they can to keep undesirable materials from getting into the process- and cooling-water collection systems. Our supervisors at all levels are encouraging these efforts, and we are making use of our refinery newspaper and all our other publicity media to get the message across. We're pleased with the way employees are responding; they have improved a number of operating practices.

Early in May we increased the oxygen input to our bio-flotation process by about 1,200 to 1,500 pounds a day. Research and pilot-plant work had shown us that this could be done by submerging still further the water-wheels or "brushes" that supply air to the process. This required a minor modification to the equipment.

At the same time we began a regular preventive maintenance program for our aeration equipment. We knew the equipment was going to be subjected to more severe duty, and we didn't want to increase the time it might have to be out of operation for repairs. The new maintenance program has meant, of course, that we have had additional operating costs.

In June our company approved the installation of four 20-horsepower Welles Aqualators, and these have been in operation since September. They have increased the supply of oxygen to the bio-flotation process by about another 4,000 to 5,000 pounds a day. This is important because residual organic matter decomposes more quickly and thoroughly with the addition of more oxygen.

In October we took our most recent step toward further improvement in our effluent-water quality. Our studies have shown a problem at the section of the refinery where we manufacture refined waxes, medicinal white oils, and other products. The process water from this section contains small amounts of organic sulfonates and other emulsifying agents.

We installed temporary facilities that allow us to segregate this stream and dispose of it separately. The performance of our process-water treating facilities improved, as we were able to demonstrate clearly -- so we are now making permanent provision for segregation and separate treatment of this stream. Meanwhile we are continuing to use the temporary facilities.

Our plans for the future are based to a large extent on the results of discussions we have had with

Russell C. Mallatt

representatives of the Indiana Stream Pollution Control Board. Early in July we submitted to the board the data from a special survey of effluent quality recommended by the conferees. These data included three 24-hour composite samples and 17 quality parameters. We have also continued our past practice of submitting monthly summaries of effluent quality.

Reviewing this information with board representatives, we have concluded that we should work toward reducing still further the phenol and ammonia content of our process-water effluent. A reduction in threshold odor number is also desirable.

We believe we can make these quality improvements by either of two methods. Both involve segregation and separate treatment of additional components in our combined process-water stream. I am referring now to certain small-volume condensates from the catalytic cracking, vapor recovery, and crude-oil distillation units. Part of these condensates are now routed to a catalytic cracking unit regenerator for disposal. The remainder, though, enter the process-water collecting system, where they add to the load on our treating facilities.

To segregate and handle these condensates separately, we will have to construct either a 5,000-foot-deep disposal well or one or more condensate sour-water strippers. Costs and the degree of quality improvement would be comparable by either, method. At the same time, both involve certain operating disabilities and risks -- so the choice will not be easy to make.

I mentioned last March that we were watching with interest the success of neighboring companies in the use of deep wells for disposing of small-volume concentrated wastes. Since then we have completed an engineering design and cost estimate for a well suitable for our own purposes. We have not, though, gone ahead with construction plans, because we want to complete an evaluation of the alternatives.

Our enthusiasm for the deep-well method has been dampened by recent laboratory work which shows that condensates react with the brine in the Mt. Simon sandstone to form an amorphous precipitate. We think it is possible that by introducing enough treated buffer-water in the well before use we could reduce the plugging of the sandstone pores and lessen the chance that the well wouldn't operate properly. This point, however, needs some further study.

Meanwhile our engineering department has begun design work on the alternate disposal method involving strippers.

I would predict that our engineering work will be finished and we will reach a decision on the alternate cases by April 1, 1966. It takes about nine months to get delivery on some items of equipment after they are ordered -- so we expect that the completion date for either a well or strippers would be some time during the first half of 1967. This will be our next major step forward at Whiting.

Now let's turn briefly to the Calumet Nitrogen Products plant at Hammond. Here I am pleased to report we have also taken some positive steps to further improve the quality of water discharged to the Indiana Harbor Ship Canal.

Early in the summer we began diverting additional water containing ammonia and nitrate to the Hammond Sanitary District, eliminating it from our effluent.

Then, following a review of special survey data in August, we reduced the alkalinity and suspended-solids content of our effluent. We did this by discontinuing the lime treatment of boiler feed water and by disposing separately of a small-volume spent caustic stream. Repair work on collecting systems has caused some delay in gaining the full benefit of these moves --

but the plant effluent should be of satisfactory quality in 1966.

In conclusion I would like to thank the conferees for giving me the opportunity to serve on their technical committee.

I think the recommendations of the committee constitute a significant contribution to establishing water quality criteria for Lake Michigan and its tributaries and to the establishment of guideposts for the abatement program.

We reached substantial agreement on the most important points.

It seems only fair to point out, however, that we were not unanimous on setting specific limits on some measurements of what is permissible in the area of contamination. I, for one, think that compliance with some of the criteria established cannot be determined by the analytical methods we employed. We just cannot be that accurate in our analyses. Where this situation exists, the recommendations seem to me to be open to question.

I do, though, concur in the substance of the report.

Now I would like to conclude my report by running quickly through a few slides.

Russell C. Mallatt

May I have the first slide, please.

The first slide shows a general view of the Whiting Refinery, and it is designed to give some idea of the complexity of operations.

Second slide, please.

Our second slide shows the extensive treatment facilities at the terminal end of our collecting systems. The oil-water separator system shown near the top of the slide is one of the most extensive in the world. The main separator consists of 34 compartments, each divided into a primary and secondary stage of development.

The large bio-flotation basement shown in the bottom center section, the most obvious part of the facility, is divided into five compartments as shown and provides four stages of aeration.

The tanks at the right comprise our emulsion-treating facilities. Our sludge-handling and de-oiling equipment is also located in this general area.

Next slide, please.

This slide shows the rotating brush type aerators that constitute part of the basic design of the bio-flotation process. There are about 700 linear feet of aerators in the basement capable of introducing into the water approximately 30 to 35 pounds of oxygen per linear foot per day. The oxygen is impelled into the water in finely dispersed form -- I think this is evident from the slide -- providing maximum surface area for transfer of oxygen from air to water and also providing a flotation and stripping action. In this sense it is a combination process.

Next slide, please.

This slide shows three of the four supplemental aerators installed just recently. They are quite spectacular in appearance and they provide the additional 4,000 to 5,000 pounds of oxygen that I mentioned in the technical report.

Next slide.

This slide shows the location of the new aerators in the bio-flotation basement. We concentrated them in the first aeration compartment to enable maximum use of the additional oxygen.

The slide shows also data from an oxygen profile made recently in the terminal ends of the aeration compartments.

From three to five parts per million of dissolved oxygen are present at the terminal ends of the respective sections. The concentration of oxygen near the front end of each compartment is, of course, at or near the saturation point.

Additional oxygen is picked up by the treated water as it passes through the effluent channel.

Next slide, please.

This slide reflects improvement in effluent quality caused in part by addition of more oxygen. The solid line shows the phenol content of the effluent which throughout the last several months has been of the order of 0.3 to 0.4 parts per million.

In recent years there has been a marked seasonal upswing in phenol content of effluent starting in the early fall. This year the phenol content has remained fairly constant through November. We expect some increase actually in January and February as water temperature is dropping.

One more slide, please.

As you probably know, phenolic compounds can either be treated out of effluent by biological processes, or under some circumstances they can be removed at the source. Thus far we have employed biological treatment. The deep well or stripper and ancillary equipment which I discussed are designed to remove additional phenols as well as ammonia before they enter the collecting system.

Thus, we will be working on both ends of the pipe, so to speak.

This final slide shows reductions in the residual amounts of these two materials that we would expect to accomplish with the new facilities to be installed durthe first part of 1967.

We are always a little bit conservative in these estimates, because we like to live up to them.

That's all for the slides.

MR. STEIN: Thank you, Mr. Mallatt, for an excellent presentation.

Just to show you how closely we are working with industry, the last time I was at this conference as a Federal official, I got gifts from the last two companies who appeared. The first one let me have a pencil which I have been using labeled "Union Carbide." But the American Oil Company, Mr. Mallatt, came up with a real unusual gift. He gave me a duplicate of my American Oil credit card. I have been using that, and it works. The bills come every month. (Laughter)

MR. MALLATT: We hope it served you well. (Laughter)

MR. STEIN: Mr. Mallatt, I see one sentence here in the Indiana report that I wonder if you can clarify. They said, "Additional in-plant controls and improved housekeeping practices are needed to eliminate periodically high concentrations of oil and phenol in the effluent."

You are talking about condensate phenol and various other taste and odor-producing substances. How about the high concentration of oil? Is your program prepared to handle that? Or is that completely covered in both reports? On its face there might be a little doubt.

MR. MALLATT: I don't believe we have an oil problem actually at the refinery. There are times, of course, when oil concentrations in the effluent are higher than at others. I think this is the point that Mr. Miller has referred to, and it does tie in, in a sense, with this idea of improved housekeeping.

It is a question here of defining what you mean by improved housekeeping. I have mentioned, for example, that we have had a concerted program to remove suspended solids, clay, from our dewaxing plant and our heavy oils area to remove certain sulfonates. I think it is the periodic appearance of these in our collection system that causes somewhat higher levels of oil in the effluent by interfering with the performance of present facilities.

And so we do have a very aggressive and continuing program of housekeeping, but we can define more precisely what we mean by housekeeping when we say we are trying to keep these specific substances out.

MR. STEIN: Yes. I think that clarifies it.

Are there any other questions or comments?

(No response.)

Thank you very much, Mr. Mallatt. I want to extend my thanks for your efforts on the technical committee, both you and Mr. Bishop, Mr. Harbaugh, Joe Barnes, and the others who were on the committee, for coming to these committee sessions.

As you know, Mr. Kittrell reported there were 14 sessions involving 25 days, and this was indeed a real public service donated by industry. The companies let the representatives go, and we are very, very appreciative of it.

I do think if we are going to achieve pollution control in equitable measures there is no other way to do it that I know of. This is something that we have to, I think, continue doing -- have a close and painstaking dialogue going on among industry representatives, State representatives, local ones, and us. Otherwise, we are not going to come up with an effective program.

Thank you very much.

MR. MALLATT. Thank you, Mr. Chairman. It has been a distinct privilege to serve on this committee.

MR. STEIN: Thank you.

Mr. Poole.

MR. POOLE: Now, last on my list I want to call on Dr. G. H. McIntosh, Chief Chemist of American Maize-Products Company.

George H. McIntosh

STATEMENT OF
GEORGE H. McINTOSH,
CHIEF CHEMIST - QUALITY CONTROL,
AMERICAN MAIZE-PRODUCTS COMPANY,
HAMMOND (ROBY), INDIANA

DR. McINTOSH: Mr. Chairman, Conferees, ladies and gentlemen:

My name is George H. McIntosh. I am Chief Chemist - Quality Control of the American Maize-Products Company, Hammond (Roby), Indiana, on whose behalf I am speaking today.

American Maize-Products Company is a manufacturer of starches and syrups, and we derive these principal products from corn as the raw material. Our plant is located in Hammond, Indiana and is approximately 2,000 feet from the south shore of Lake Michigan.

We have a 36-inch fresh water intake 2,200 feet offshore, and a 36-inch outfall back into the lake about 800 feet offshore. We pump an average of 11,000,000 gallons of water from the lake each day of operations, and return to the lake as cooling water an average of 9,000,000 gallons. The 2,000,000 gallons that are retained are treated in our water treatment department and are used by our power department and in certain stages of our process.

The primary objective of our entire process is to isolate the starch from the corn kernel. The process that we employ to derive the starch from corn is called the "wet milling process." All the materials in the processing stages are handled in the slurry form. It is a typical "bottled up system" for the recovery of the various components.

Fresh water enters the system only for washing the starches in the final stages. These wash waters or filtrates are used over and over countercurrently in the operations and eventually leave the system as concentrated corn steepwater. The raw water required to condense the vapors in the evaporation of these process waters will approach three to four million gallons per day. Another four to six million gallons of raw water is required to concentrate the corn syrups which are made from a portion of the starch.

It is in the concentration of these liquors that traces of the product can be carried to the condensing or cooling waters. This is especially true for steepwater which is more prone to foaming and uneven boiling. This is one of the two principal sources of contamination of the cooling waters we return to Lake Michigan.

At this point I would like to give a brief description of the waste waters that arise in our operations and which are the second source of the contamination of the water returned to Lake Michigan. We have an average daily volume of 1,000,000 gallons. These waters are collected from the different departments and are handled through a separate system. They are as follows:

1.	Condensate from the evaporation of the corn steepwater -	300,000 gals.
2.	Syrup refinery process wash waters, floor washings and some condensates	280,000 gals.
3.	Starch washwaters or filtrates that contain materials that prevent reuse for food processing -	100,000 gals.
4.	Excess process water that we are unable to concentrate at certain times -	30,000 gals.
5.	Miscellaneous waters such as floor washings, surface drainage, roof drains, boil-out water from the evaporators, and some cooling waters —	190,000 gals.

These waste waters are diverted to a three-stage lagoon system for treatment. The lagoon consists of two anaerobic sections followed by an aerobic section. The total area is approximately ten acres with a capacity of 18,000,000 gallons. The effluent from this lagoon treatment is mixed with the cooling waters and returned to Lake Michigan. This is the second source of contamination.

All sanitary sewage is sent to the Hammond Sanitary District. We have a separate, isolated sewer system in our plant for these waters. We send no sanitary sewage to Lake Michigan.

In our statement at the first meeting of this conference in March 1965 we stated that our 1965 industrial waste control program called for several corrective measures. We estimated that these corrections should give a 50 per cent reduction in the loadings. The corrective items were as follows:

1. Divert to the lagoon some condensates from the cooling waters that were going to Lake Michigan.

2. Increasing the capacity of the lagoon.

3. A clarifier for some of the waters going to the lagoon.

4. Installation of a surface condenser on a large evaporator used for concentrating corn steepwater.

The status of these projects is as follows:

1. The diversion of the condensates from the cooling water to the lagoon was completed early in May 1965.

In our plant about 55 per cent of the boiler feed water is condensate returns collected throughout the plant. The return lines are equipped with conductivity cells and dump valves. If there is any contamination in the condensates they are automatically dumped. In the syrup refinery these waters went to Lake Michigan. Now, in case they are contaminated with traces of corn syrup, they go to the lagoon.

2. The holding capacity of the lagoon was increased by additional diking and the installation of a new outlet on the aerobic section. The capacity was increased by approximately 3,000,000 gallons. This gives us three more days of retention time.

This project was completed in May 1965.

3. The clarifier for the reduction of the suspended solids in the starch filtrate waters going to the lagoon was completed in September 1965.

4. Surface condenser for the steepwater evaporator.

This was a major project as it entailed considerable construction and alterations to the existing building. The project was completed and went into operation on December 15, 1965.

This unit will separate the condensate from the cooling waters, and the condensate going to the lagoon for treatment. The other evaporators used for concentrating the steepwater have surface condensers.

In addition to the above projects we installed a TM-3 DoorClone unit on the filtrate waters from one of the starch dryers. This reduces the load to the clarifier and enables us to reclaim the starch and return it to the finished product. This project was completed in November 1965.

The total cost of the above five projects was $135,720. Since some of these projects have only been recently completed, we can not give an evaluation of their effectiveness on the reductions in our loadings at this time. However, preliminary tests indicate that we should accomplish the 50 per cent reduction as predicted.

We completed several major projects of modernization in the plant late in 1964 and early in 1965. We will not go into detail on these items other than to say that operations were back to normal starting in April 1965. On this basis we would like to use the seven-month period May through November versus the same period in 1964 to show the progress we have made in our industrial waste program.

OVERALL LAGOON EFFICIENCY

% B.O.D. (p.p.m.) Reduction

Year	May	June	July	Aug.	Sept.	Oct.	Nov.	Ave.
1964	89.0	91.4	92.7	92.3	90.8	86.9	80.1	89.0
1965	91.6	95.2	93.0	94.5	94.7	93.0	89.2	91.6

EFFLUENT FROM LAGOON

B.O.D. (p.p.m.)

Year	May	June	July	Aug.	Sept.	Oct.	Nov.	Ave.
1964	412	437	340	308	351	534	631	430
1965	211	175	187	201	207	298	381	237

Increase in average reduction 45%

LBS. B.O.D. FROM LAGOON

Year	May	June	July	Aug.	Sept.	Oct.	Nov.	Ave.
1964	3529	3743	2912	2638	3006	4573	5404	3686
1965	2026	1680	1796	1930	1988	2862	2507	2113

Increase in average reduction 43%

LOADINGS TO LAKE MICHIGAN

	B.O.D. (p.p.m.)			B.O.D. (lbs.)		
Month	1964	1965	% Reduction	1964	1965	% Reduction
May	179	50	72.1	13,794	4,209	69.5
June	87	52	40.2	7,347	5,287	28.0
July	86	44	48.8	7,948	4,897	38.4
Aug.	55	47	14.5	5,675	5,405	4.8
Sept.	79	60	24.1	8,473	6,871	18.9
Oct.	96	54	43.8	8,162	6,248	23.5
Nov.	92	48	47.8	6,965	5,248	25.2
Average	96	51	41.6	8,338	5,447	29.8

George H. McIntosh

During this seven-month period in 1965 we processed 14.0 per cent more corn than was processed in 1964.

The tables show that the average loading to Lake Michigan was 5,447 pounds of BOD. That is per day. The loadings from the lagoon were 2,113 pounds of BOD leaving a loading of 3,334 pounds of BOD for all other plant operations. Our analysis of the process waters show that approximately 2,500 pounds of BOD comes from the steepwater evaporator that was not equipped with a surface condenser. With the installation of this unit we should reduce the total loading to Lake Michigan to a daily average of 2,947 pounds of BOD per day.

Our 1966 program for the following items:

1. Increasing the efficiency of the lagoon treatment by additional mechanical aeration. One aerator has been purchased and is scheduled to go into operation by mid-January. If this unit works successfully during the cold weather, four additional units will be purchased and installed by May 1, 1966. Our research shows we should be able to attain over 50 per cent reduction in the BOD loading leaving the lagoon.

We have budgeted $19,000 for this project.

We also have under consideration a new type aerator which we believe is worthy of purchasing for experimentation.

2. We have on order a large gasoline engine driven pump to be used as a "stand-by" for the waste waters going to the lagoon. They are lifted to the lagoon by an electrically operated lift station. When there is a power failure they would go to Lake Michigan. This has occurred in a few instances in the past.

3. An engineering survey has been made for the elimination of some roof drains and surface drainage from the Lake Michigan waters.

Our analyses have shown that during heavy rainfall there is very little organic loading from these sources. There are a few areas where they might be a contributing factor and these will be eliminated.

4. We will continue our program for reuse of process waters and the conservation of raw water. Our chemical engineering department has a well-defined program under way in this field.

5. We will continue the program of good housekeeping to control loss of products at the source. We have an engineer assigned full time to this work.

At the conclusion of the March 1965 conference the conferees had recommended all industries to monitor and chlorinate their effluents. We have been doing this since 1950. We also have had a modern laboratory, with a chemist and two senior technicians assigned full-time to the industrial waste program. In addition to the outfall sampling we have 33 sampling stations throughout the process. These stations have continuous samplers and are collected at eight-hour intervals. The analyses are made daily, seven days per week. A bacteriological analysis is made five days per week. Monthly reports of our daily operations are made to the Indiana Stream Pollution Control Board and to the Hammond Sanitary District.

Our management policy in this entire problem has been and will continue to be one of full cooperation with all agencies.

MR. STEIN: Thank you, Dr. McIntosh, for a very full statement.

Are there any comments or questions?

(No response.)

If not, thank you very much.

I think we have come a long way in pollution control. I remember when I first got into this business there was some case, I think, involved Indiana and Illinois and all your companies. When I look back on those days and to where we stand today, I think we have made a little progress.

DR. McINTOSH: We have made progress.

MR. STEIN: Thank you.

Mr. Poole.

MR. POOLE: That completes the Indiana portion of the program, Mr. Chairman.

MR. STEIN: Mr. Poston.

MR. POSTON: I would like to pose a question to Mr. Poole. We have had a number of presentations that dealt with disposal of waste into the deep aquifers, some 5,000 feet or thereabout. I haven't heard anyone say what precautions are being taken to assure us that these wastes pumped into the lower aquifers might get back into some fresh water supplies.

I would like to ask Mr. Poole if he would care to comment on this, on what is being done on this line.

MR. POOLE: I will comment, but I would like to turn it over to my colleague, Mr. Miller, for more detail.

When each of these cases comes up, and particularly beginning with the first one, which I think was Midwest, they involved the Mt. Simon. We immediately took it up with the geologist of the State Department of Natural Resources and also with the representatives of the United States Geological Survey that are involved in ground water more particularly in Indiana. As a third source of information we went to the Geology Department of Indiana University.

Having no geologists on our own staff, we chose this route because the Indiana law covers ground water pollution as well as surface water pollution.

Our decisions in all of these cases as they have come along have been predicated on the advice that we have gotten from this group of geologists -- usually I believe there are five or six different ones involved — plus the independent findings that are made by the various companies before they come to us with a proposal.

Now I would like to give Perry an opportunity to elaborate just a step farther.

MR. POSTON: Yes.

MR. MILLER: I think in answer to Mr. Poston's question there are several areas of disposal in deep well injection. First of all, you have an aquifer that doesn't contain potable water. In other words, it is brine or contains dissolved solids which are present. Therefore, it is not usable as a fresh water source.

Then you want a continuous strata, one wherein you will not build up back pressure that would fracture the seal over the top in the form of another formation.

And then in the construction of the well itself we have required you go down with a large casing and that you seal this by grouting from the bottom up. Then you put another casing inside of this going all the way down to the formation in which you propose to dispose of the waste material. Then you grout this from the bottom all the way up, so that you have two steel casings at least with concrete in between them, so that there can be no connection with a fresh, potable aquifer.

In addition to this, in the ones that you saw yesterday in the U. S. Steel presentation and in the Midwest and I'm sure in the Bethlehem we have injection tubes which go down in the inside, and the waste material then is injected in the aquifer through the injection tube. They also monitor the water in the casing between the injection tube and the inner casing in order to satisfy themselves that they will not in any way contaminate a fresh water aquifer.

Now, as an example of capacity in this area, it is my recollection at least that here with the Mt. Simon and the Eau Claire it is impossible to determine where one starts and the other stops, and you have approximately a depth of 2,000 feet. So you begin to see the capacity that you have to utilize as you go a few feet from the well with 2,000 feet to dispose of these wastes.

So we have a large capacity for the disposal of wastes in this area that are compatible with the formation.

But I think Mr. Mallatt also pointed out some of the hazards that can arise, in that if it isn't compatible your well won't operate and you have a considerable sum of money in a facility that is of no value to you.

MR. STEIN: Thank you.

Are there any further questions or comments?

MR. POSTON: I have nothing further.

MR. STEIN: If not, it is proposed that this might be a good point to recess for lunch. We would hope to make it in an hour and a half today and reconvene promptly at one-thirty. We will start with the Illinois presentation and then go to the Sanitary District.

We stand in recess until one-thirty.

(Whereupon, at 12:02 p.m., the luncheon recess was taken.)

AFTERNOON SESSION

1:40 p.m.

MR. STEIN: May we reconvene?

I would like to call on Mr. Clarence Klassen of Illinois.

STATEMENT OF

CLARENCE W. KLASSEN, CONFEREE

MR. KLASSEN: Mr. Stein, as the Illinois conferee, I want to call on Mr. Klassen, Technical Secretary, to state why he is going to present this.

MR. STEIN: That's fine. (Laughter) Now I know why they call you "technical secretary." (Laughter)

MR. KLASSEN: Mr. Chairman, in the role of Technical Secretary of the Illinois Sanitary Water Board, I thought for several reasons I wanted to present our very brief summary report.

I say "brief" because the area in the conference that is under the jurisdiction of the Illinois Sanitary Water Board is a very small area.

For those of you who were not in the March 2 conference I want to explain this particular situation. By law the area within the Chicago Sanitary District boundaries is exempted from State jurisdiction -- that is, State Sanitary Water Board jurisdiction. Inasmuch as the District covers almost entirely Cook County, the few isolated areas in Cook County that are under the Illinois Sanitary Water Board are primarily within the area under the discussion of this conference. They in general include Chicago Heights, Flossmore, Homewood, Park Forest, Thornton and Lansing.

I just wanted to explain this particular situation of why our report will be brief and cover such a small area.

The waste originating in this particular area does not contribute directly to the interstate pollution of Indiana waters. But since this is a technical session, I feel that technically we must say that under possibly unusual hydraulic conditions it is conceivable that some of these wastes, by going through the Little Calumet to the Calumet, backing up the Calumet, could conceivably enter Indiana waters, although so far as we know this has not taken place.

However, I do want to emphasize that this area under the jurisdiction of the Illinois Sanitary Water Board is bound by and is abiding and will continue to abide by all of the results of this conference.

Mr. Chairman, I wanted to present for the record a complete written report. I will just emphasize the high points. This report has been made available to the conferees. There are copies that I understand are still available on the desk outside. I will merely touch some of the points that I think are important enough to emphasize at this time.

MR. STEIN: Do you want the whole report incorporated in the record?

MR. KLASSEN: Yes.

MR. STEIN: Without objection that will be done.

MR. KLASSEN: The HEW conference of March 2-9, 1965 resulted in recommendations by the conferees accepted by Secretary Celebrezze April 14, 1965. Recommendations immediately germane to this report were as follows:

The pollution control agencies will -

1. Institute immediate action that all sewage receive at least secondary treatment plus adequate effluent disinfection within one year after the issuance of the summary of the conference.

2. Institute immediate action to insure that industries will institute housekeeping practices which will minimize the discharge of wastes from industrial sources and to insure optimum operation of sewage systems and sewage treatment facilities to minimize bypassing of sewage treatment plants or other practices that result in the discharge of untreated or partially treated

wastes.

3. Undertake action to insure that industrial plants discharging wastes into waters, institute programs of sampling their effluents to provide information about waste outputs needed by the agencies in the carrying out of their functions.

4. Maintaining close liaison with the technical committee, develop a time schedule for the construction of necessary industrial waste treatment facilities.

5. Have the primary responsibility for surveillance.

REPORT OF PROGRESS

1. Sewage Treatment

All municipal wastes including industrial wastes discharged to municipal sewerage systems are not tributary to secondary treatment works. Two municipalities have additional tertiary treatment facilities under construction and the remaining municipalities are developing plans to provide at least partial treatment for all bypass flows during emergency or storm flow periods.

I do want to call attention to the fact that these stabilization ponds for effluent polishing and for peak flow equalization were not part of the recommendations of the conference, and this is in addition to

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what is being required.

All communities are proceeding with plans to install facilities for chlorination of the final effluent and to be in operation by April 14, 1966. Several inaugurated chlorination during 1965. All communities are currently submitting monthly operating reports to the Sanitary Water Board.

Municipalities are listed in Table 1 below, including stream and treatment status. Type plants include Trickling Filter (Ft), Sand Filter (Fs), Activated Sludge (Aa), Contact Stabilization (Ac), and Extended Aeration (Ad). Stabilization ponds for effluent polishing and peak flow equalization were not specified by the conferees.

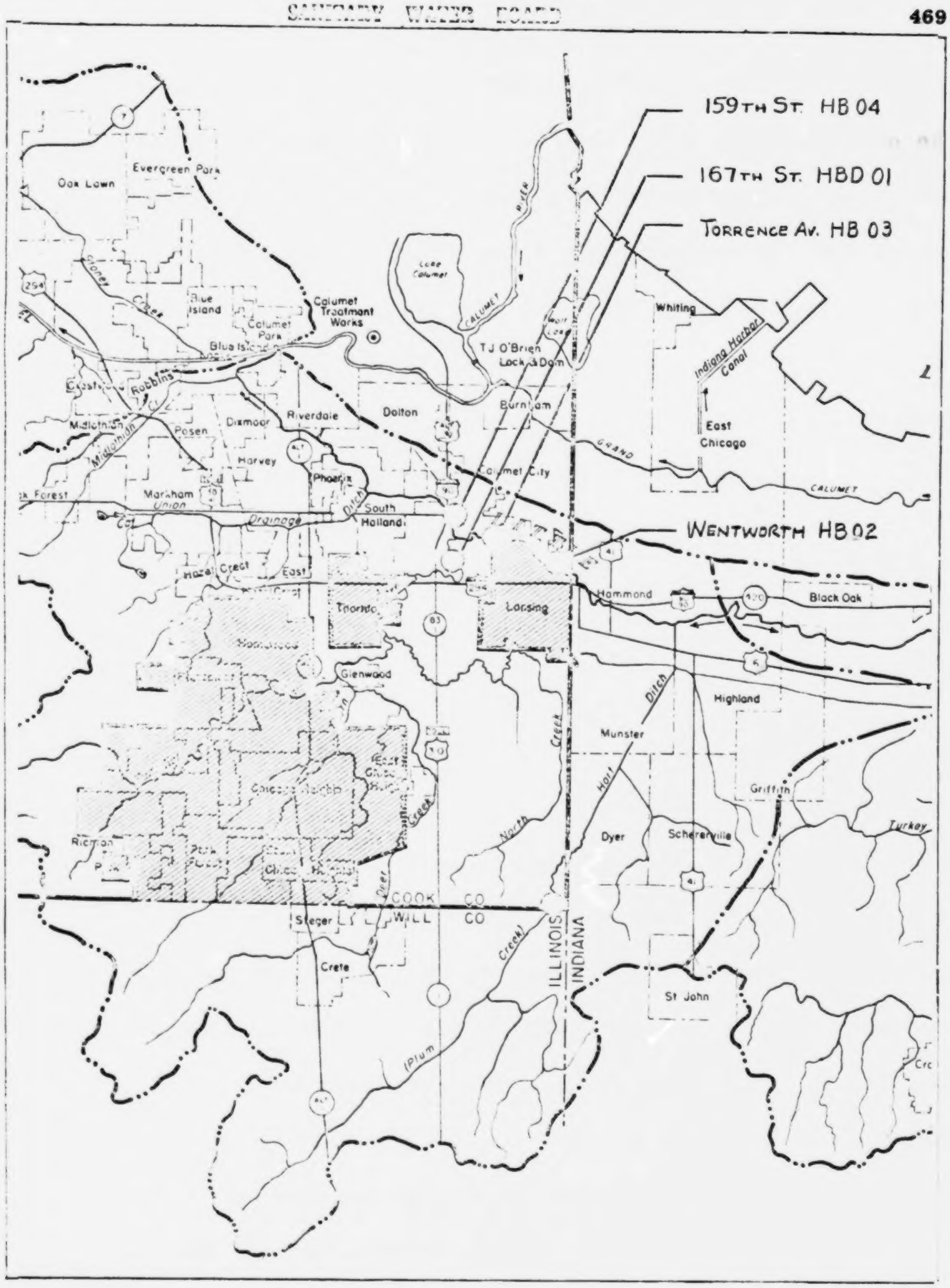
It is anticipated that all of these proposed facilities will proceed on schedule, with chlorination of effluents by April 14, 1966.

This was my particular reason for inquiring regarding the city of Hammond and being concerned that apparently they will not be chlorinating until October 1966.

(Table 1 and a map showing jurisdiction in the conference area of the Illinois Sanitary Water Board follow:)

TABLE I

Municipality	Type	Stream	Secondary Since	Chlorination		or Engineers Retained	Added Treatment	Design Pop.	Connected Pop.	Effluent Equivalent
				Temp.	Perm.					
Lansing	Ft	Little Calumet	1959			June '65		25,000	18,500	2,760
Thornton	Ft	Thorn Creek	1959		Permit Issued		Final Pond Designed	4,500	2,890	434
Bloom Twp. San. Dist.	Aa	Thorn Creek	1957		Bids 1/6/66		Expansion Planned 1966	60,000	75,000	15,000
Flossmoor	Ft	Butter-field Cr.	1956		Under Constr.		Final Pond Under Constr.	8,000	4,800	720
Homewood	Ft	Butter-field Cr.	1956			Oct.'65	Expansion Planned	16,000	15,000	2,250
Matteson	Ft	Butter-field Cr.	1959	8/1/65	Annexed to MSD Chgo. Jul.'65			5,000	3,300	494
Olympia Fields Graymoor	Fs	Butter-field Cr.	1954	5/1/65	9/1/65		May close in 1966	400	260	26
Olympia Fields Main	Ft	Butter-field Cr.	1956			June'65		2,500	1,400	210
Olympia Fields Woods	Fs	Butter-field Cr.	1959			June'65		1,500	400	40
Richton Park	Aa	Butter-field Cr.	1964			Sept.'65		3,000	1,050	165
Crete	Ft	Deer Cr.	1956	1965	Under Constr.		Final Pond under Constr.	4,000	3,790	565
Wood Hill Subdivision	Ac	Deer Cr.	1962		1962		Final Pond Proposed	2,500	1,000	100
Lincolnshire Country Club	Ad	Deer Cr.	1962			Sept.'65		110	40	6
Green Briar Subdivision	Ad	Deer Cr.	1965			Nov.'65	Final Pond	120	New	
Steger	Aa	Third Creek	1957			June'65	Final Pond Planned	10,000	6,430	950


159TH ST. HB 04
167TH ST. HBD 01
TORRENCE AV. HB 03
WENTWORTH HB 02
Oak Lawn
Evergreen Park
Blue Island
Calumet Park
Calumet Treatment Works
Lake Calumet
Calumet River
Wolf Lake
TJ O'Brien Lock & Dam
Whiting
Indiana Harbor Canal
East Chicago
Crestwood
Robbins
Midlothian
Midlothian Cr
Posen
Dixmoor
Riverdale
Dolton
Burnham
Harvey
Markham
Phoenix
Calumet City
Grand Calumet
Oak Forest
Union Drainage Ditch
South Holland
Hazel Crest
East
Thornton
Lansing
Hammond
Black Oak
Glenwood
Highland
Munster
Hart Ditch
Griffith
North Creek
Chicago Heights
Richton Park
Park Forest
Deer Creek
Dyer
Schererville
Turkey
COOK CO
WILL CO
Steger
Crete
Plum Creek
ILLINOIS
INDIANA
St John

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There are just a couple of points in this table. The one remaining problem area is Chicago Heights, Bloom Township Sanitary District. Tomorrow bids are being opened for the chlorination facilities. It is expected that within the next few weeks this will culminate in the issuance of contracts that will result in their chlorination facilities.

They are also planning plant expansion for 1966.

This table gives the present status of the temporary and permanent chlorination facilities. The dates for secondary treatment are all given. This is the most up-to-date date when some secondary treatment facilities were either installed or enlarged. They all have secondary treatment.

I do want to call your attention to a part of this table that we hope will be copied by other municipalities in this whole area. We feel that the time is here when we have got to talk in definite terms of what is going into a stream rather than percentages of reduction, all of which is good.

We have listed here the design population of the municipal plant, the connected population, and the population equivalent that is going out in the effluent.

I might say that all of this information goes into our data processing now, and the first of every month there is coming out of data processing a list of the towns that are up to 80 and then 90 per cent of their connected population load.

While we have listed the population equivalents here, they are relatively small. But I hope that this will set a pattern -- we are not trying to be subtle about this -- set a pattern for future reporting certainly by us and by other municipalities so that we will have some yardstick to determine what improvements are being made.

2. Industry Treatment Operation

Two joint meetings were held by the Sanitary Water Board and representatives of the industries at the Bloom Township Sanitary District Offices. This involves the Chicago Heights area. This is the only area in which there is any appreciable industry involved. Industry was informed of its responsibility to sample waste flows and to maintain maximum operation of process, in-plant control, pretreatment or treatment.

The majority of the industries discharge to the municipal sewer system with some treated effluents and cooling water to the storm sewers. Extensive engineering studies were made in 1959 and 1963 resulting in modification and improvements to industry control. The 1963 report is the basis for design of Sanitary District treatment plant improvements and expansion scheduled for 1966-1967. This project will have direct influence on future needs and improvements within industries.

We know that this is going to influence what some of the industries will be doing within the next few months there. They are going to have to determine whether they are going to discharge to the municipal sewer system or continue to discharge to the storm sewer system of Chicago Heights.

The City of Chicago Heights has been reminded of its responsibility in regulating sewer use and prevention of pollution that might be involved in the use of their storm sewers.

Surveillance or contact has been made by the Sanitary Water Board with those industries having direct discharge to waterways. Those having problems have made, or are planning, corrective action. In addition, there are several industries with treated effluent discharge to the storm sewer system that need to improve control and operation or increase the degree of treatment.

Scheduling of these contacts and programing of needed improvements is planned for the next six months. Delay has been based on the need for the conferees to define parameters or the water quality criteria which I am certain will be a result of this particular meeting.

We believe in naming names, so the industries with direct discharge tributary to Thorn Creek include:

Calumet Steel Company, cooling water only, no pollution problem.

Armour Agricultural Chemical Company, cooling water, acid problem.

Certain-teed Products Corporation, fiber and settleable solids, recovery system is proposed.

Midwest Forging and Manufacturing Company, acid waste, oil and scale, recovery system and neutralization needed.

International Minerals and Chemical Corporation, phosphates, installed second settling basins November, 1965.

Alco Products, Inc., oil and boiler sludge, API separation in use.

3. Industrial Sampling Program

Industries have maintained reasonable sampling and flow data on discharges to municipal systems. Much of this is done cooperatively with the municipality as an adjunct to adequate treatment operation. More extensive data programs will be instituted based on parameters necessary to meet the water quality criteria adopted.

4. Time Schedule for Industrial Facilities

The Illinois Sanitary Water Board withheld establishment of a specific schedule for improved or added industrial waste treatment facilities pending formal adoption by the conferees of the technical committee recommendations which are germane to determining abatement needs. Industrial pollutants discharged to waters under Sanitary Water Board jurisdiction are at relatively low levels. Initial approach has been made with industries having direct outlets to water courses. The bulk of industry is tributary to municipal sewerage works or storm sewer systems, and initial activity is through the municipality.

5. Surveillance Program

An expanded monthly sampling program by the Sanitary Water Board was initiated on May 1, 1965 to obtain additional water quality data for the Little Calumet River, Thorn Creek and Third Creek river systems. Eight stations have been sampled and five more are under consideration.

In addition, sewage treatment works effluents are sampled routinely and analyzed for pH, BOD, Coliform and Enteroccus. Thirteen effluents are now sampled and three more small units will be added to the program.

Present water sample analyses include some and omit some of the water quality criteria analyses proposed for the Little Calumet River by the technical committee. It will be necessary to add to or adjust the laboratory analyses made to include needed information. Table 11 includes a summary of results at key stations.

(Table 11 follows:)

ILLINOIS SANITARY WATER BOARD

TABLE 11

Illinois Indiana Interstate Pollution
Water Quality Surveillance Program - Little Calumet River
May - November 1965

Constituents, Criteria and Measures		SAMPLING STATIONS			
		Control Point - Wentworth Av. (HB 02)	Upstream from Thorn Creek Torrence Av. (HB 03)	Thorn Creek at Mouth 167th St. (HBD 01)	Downstream from Thorn Creek 159th St. (HB 04)
Coliform Bacteria - 5000 MPN/100 ml. Max. (except during storm runoff)					
Average	(2) (3)	91,000	2,280,000	97,000	150,000
Maximum	(2) (3)	320,000	11,000,000	200,000	500,000
Storm runoff value	(2)	2,400,000	3,800,000	---	400,000
Fecal Streptococcus - 500/100 ml.(MF) Max. (except during storm runoff)					
Average	(2) (3)	880	470	1,280	350
Maximum	(2) (3)	4,000	1,000	4,000	1,000
Storm runoff value	(2)	18,000	21,000	---	3,100
Turbidity - No substantial unnatural amounts					
Average (units)	(3)	10	9	11	10
Range (units)	(3)	5 - 17	16 - 18	5 - 15	5 - 22
Storm runoff value		48	46	--	380
Temperature - NGT 90° F					
Maximum		75	75	76	76
pH - Range 6.5 - 9.0					
Median		7.8	7.8	7.6	7.6
Range		7.5-8.3	7.5-8.0	6.7-8.0	7.2-8.1
Dissolved Oxygen - NLT 4.0 mg/1 Ave.May-Sep. NLT 2.0 mg/1	(4)				
Ave. May - Sep.		5.4	5.1	3.3	4.5
Minimum		1.5	1.8	1.8	0.8
Biochemical Oxygen Demand-NGT 10.0 mg/1	(4)				
Average		11.6	9.7	9.3	6.3
Range		4 - 29	4 - 16	4 - 26	3 - 13
Methylene Blue Active Substance-NGT 0.5 mg/1					
Average		0.6	0.8	1.0	0.9
Range		0.3-0.9	0.2-1.5	0.5-1.5	0.3-1.5

NOTES

(1) Total Samples--Wentworth Av., 167th St., 159th St.-7 each
Torrence Av. - 6
(2) Membrane Filter Counts per 100 milliliters (MF)
(3) Excluding sample during period of storm water runoff
(4) Single daily value or average

ABBREVIATIONS

mg/1 - milligrams per liter
NGT - not greater than
NLT - not less than

This confirms pretty much the data that was presented by the Department of Health, Education, and Welfare that Little Calumet is polluted as it comes in to Illinois.

I think one of the interesting highlights of this summary is the fact that in two areas, assuming the present criteria are adopted, the stream is meeting these criteria. That is in temperature and pH, which, of course, are some of the easier ones.

A weekly sampling program was carried out during the months of June, July, August and September on the beaches along Lake Michigan from 12th Street to 95th Street. This data was made available to the other participating agencies routinely and included in the HEW report.

In summary and in conclusion -- and this is one of the reasons why I personally wanted on behalf of the Illinois Sanitary Water Board to present this -- I want to make the position of the Illinois Sanitary Water Board crystal clear on some of the issues that are involved in this conference.

One, that the so-called honeymoon period is over. In anticipation of the water quality standards that will very soon be adopted for the conference area, this in our opinion will remove the last justification for any further delay in receiving from any industry or municipality causing pollution a definite schedule, the answer to two basic questions:

1. What are you going to do?
2. When are you going to do it?

This is only part of the picture. Further, if the time schedule is not satisfactory and practical or if it is not accomplished, the Illinois Sanitary Water Board will require, if necessary by legal action, compliance with a schedule that is acceptable to the Board.

This is what the municipalities and industries in the Sanitary Water Board jurisdiction area can expect.

I might say at this point we are receiving excellent cooperation. But, in turn, this is what the Illinois Sanitary Water Board is expecting -- the same kind of positive action by those responsible for pollution control in the other areas in both States.

Thank you.

MR. STEIN: Thank you, Mr. Klassen.

Any comments or questions?

I am very happy to hear that statement, Mr. Klassen, because if you adopt the standards and adopt the time schedule I hope you beat us to it.

Any further comments or questions?

MR. POOLE: I would just like to add that the State of Indiana expects the same thing.

MR. STEIN: Thank you.

I think in this case you have unanimity of the State and Federal governments.

Are there any further presentations from Illinois?

MR. KLASSEN: There are no further presentations from the area of the jurisdiction of the Sanitary Water Board. We have representatives here from Chicago Heights I know, but I think I have outlined their program, their position as of this morning, and we have no further presentations to make, Mr. Chairman.

MR. STEIN: Thank you very much for an excellent statement, Mr. Klassen.

I will call on Colonel Chesrow.

Colonel F. W. Chesrow

STATEMENT OF

COLONEL FRANK W. CHESROW, CONFEREE

COLONEL CHESROW: I have been asked to speak from the podium because there has been some question as to the clarity of the microphone at my desk.

In my case I wear two hats, as a conferee and as President of the Metropolitan Sanitary District of Greater Chicago.

I speak to you now as the President of the Sanitary District, and this statement is the official policy adopted by the board of trustees who are by statute responsible for the management and control of the Metropolitan Sanitary District of Greater Chicago.

For the purpose of clarity and continuity, I should like to quote briefly from my concluding statement presented at the March 2, 1965 Conference on Interstate Pollution of Lower Lake Michigan:

> "Our deliberations concerning the pollution of the southern basin of Lake Michigan have offered a penetrating picture of the abuse of one of man's most precious possessions, namely what might well be a limitless source of fresh water. These same deliberations have conclusively revealed that man is bent on

> dissipating this God-given treasure and that unless we take drastic action, the lake waters and beaches will be lost to us forever.
>
> "We have learned that the people of Indiana, as well as those inhabitants of Illinois, are equally concerned over the future of this great body of water; that officials representing these people are determined to put an end to this desecration of one of nature's proudest possessions...."

The Metropolitan Sanitary District of Greater Chicago has been fighting pollution of Lake Michigan for three-quarters of a century and has pioneered many engineering feats resulting in many major victories in the war against contamination.

At one time our engineering feats were considered bold, daring and perhaps costly. However, as we observe the plight of other even smaller metropolitan areas tributary to fresh water lakes, we must conclude our predecessors had wisdom, vision and an excellent grasp of economics. Apparently, keeping all possible pollution from Lake Michigan has proven to be the only policy which withstood the times.

Accordingly, we are unalterably opposed to any solution that will permit any additional municipal, industrial or other wastes to enter Lake Michigan, just as we are opposed to all of the present discharges of wastes to the lake.

We are further unalterably opposed to any solution that will involve or cause any wastes to flow from the State of Indiana into the State of Illinois and thereby impose any biological, chemical or physical load upon watercourses in the State of Illinois that would require additional dilution water.

We must also record our opposition to any criteria for Lake Michigan, the Little and Grand Calumet Rivers and Wolf Lake which reflect the imposition of pollution loads on the State of Illinois by the State of Indiana.

To prevent uncontrolled diversions out of Lake Michigan through the Grand Calumet River, the proposed Barrier Dam on the Grand Calumet should be constructed within six months or the shortest possible time.

PROGRESS TO DATE

The Metropolitan Sanitary District of Greater Chicago is fully cognizant of the importance of protecting its water supply, lake front recreation and beauty. Accordingly, the District has maintained for a number of years continuous vigilance to remove sources of pollution, particularly where waters have access to the lake. This effort is evident from the actions taken prior to April 1965. However, the District is also well aware of the need for an increased rate of waste control compliance in the entire Calumet Region in order to achieve a fully controlled waste program within the reasonably near future. It is firmly believed that such a joint effort by the District and its neighbors is basic for a truly successful program.

Each of the participants to the HEW Conference of March 1965 was charged with specific assignments for expediting this joint effort for removing existing pollution and preventing new pollution. At the same time the Metropolitan Sanitary District has found it advisable to continue with increased vigor its existing pollution abatement program in the Calumet Region.

In accordance with Section 14 of the Conclusions and Recommendations, a stream surveillance program has been instituted by the Metropolitan Sanitary District to measure existing stream quality and changes of quality as new waste treatment facilities are constructed. This policing action has been established as a permanent program. We now measure the stream quality at 12 different locations within our Calumet region. This program includes a separate field crew and analysts who work exclusively on this surveillance assignment. Additional laboratory facilities have been added at our Calumet Works plant laboratory to accommodate this need. In addition, we have acquired another, a second, small boat and automatic sampler to help make this program more effective. Additional study of changes in water quality in the navigable portion of this region will be spearheaded by our floating laboratory boat which has been equipped with various quality recording instruments. This phase of our investigation will be guided by our waterways research group.

With regard to Section 11 of the Conclusions and Recommendations, industry has been directed to establish a representative sampling and quality monitoring program of each waste discharge. This program is in full operation and quality reports are being received monthly.

CHLORINATION

It was reported at the March 1965 meeting that all small Sanitary District plants have chlorination. In addition, excellent progress is being made toward chlorinating the effluents at our large Calumet Treatment Works and 95th Street Pumping Station. Overall design of our

Calumet Works facility is 52 per cent complete with the contract award scheduled for May 26, 1966 and a construction schedule of 300 days. In view of the size of this chlorination works, we have engaged Harza Engineering to do a special study on a hydraulic model of the contact chamber and mixing chamber. The model is 60 per cent complete and will be in operation late this month.

The design for the 95th Street chlorination facilities is complete and scheduled for award on February 24, 1966.

SUMMARY OF INDUSTRIAL WASTE ABATEMENT PROGRESS

Within the Calumet Region and within the jurisdiction of the Metropolitan Sanitary District we have a list of 16 industries. Several of these industrial discharges represent sizable volumes; however, a number of the industries have only small problems. Of these 16 plants, several have completely resolved their problem either by treatment or a combination in-plant modification and connection to our interceptor system.

At the onset we must not overlook the manner in which industry and the Metropolitan Sanitary District jointed together and exhibited a team effort. Certainly we have been making good progress heretofore, but the more recent efforts have exhibited a new surge of vigor to get a vast and complex job done more quickly.

Industry has been requested to submit a progress report at this conference on their pollution abatement program. It is noteworthy that the larger operations with the more complex problems have volunteered to present their resume. This in no way reflects a lack of progress or accomplishment by the smaller organizations. The accomplishments of the latter group will also be included in our general report.

We will briefly touch upon some of the areas of accomplishment for each of the industries which have been under surveillance in the Calumet Region. However, considerably more detail will be presented by those industries reporting to this conference.

(1) U. S. Steel Corporation, South Works, Chicago, Illinois

Accomplishments of this organization in the recent past will be presented by the industry. We find that they have recently installed and are now operating pumps to increase the removal of flue dust from several of their blast furnaces. A new oil skimmer was installed recently in the North Slip area, with additional oil skimming equipment scheduled for 1966 for other areas. Plans have been completed for intercepting the various discharge lines now going directly to the Calumet Harbor, the purpose being to bring these discharge points to a common terminal point where their wastes can be satisfactorily treated before discharge. In addition, improved housekeeping practices and an improved program for removal of floating solids have been reported. Sanitary wastes are discharged to city sewers.

(2) International Harvester Co., Wisconsin Steel Division, Chicago, Illinois

This industry has implemented considerable waste handling facilities in recent years and has progressed a long way toward achieving a completely closed system. Wisconsin Steel's overall program calls for the elimination of all outfalls from the river. This particular group has an excellent story of accomplishment. In fact, in the last two years, they have reduced the total pollution discharge to the Calumet River from approximately 120 to 66 mgd. All sanitary wastes and ammonia liquor are discharged to the City of Chicago sewer system.

(3) Interlake Steel Corporation, Chicago Plant

All sanitary and coke plant wastes are discharged into the Chicago sewerage system. This industry has introduced coagulant aids to its blast furnace

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secondary thickener and has achieved an exceptionally good reduction in waste load. This is evident by the fact that since our original contact with this problem in November 1964, the suspended solids reaching the river have been reduced by 62,580 lbs/day, from 71,920 to 9,340 lbs. The Chemical Oxygen Demand has been reduced by 69,300 lbs/day, from 73,400 to 4,100 lbs, and the Biochemical Oxygen Demand of the wastes has been reduced by 8,970 lbs/day, from 9,802 to just 832 lbs per day. Additional treatment facilities which have been added to this plant during the past 12 months will be reported on by the Interlake Steel Corporation.

(4) Interlake Steel Corporation, Riverdale Plant

This industry has undertaken a sizable program of separation of storm and industrial waste sewers. Approximately 80 per cent of the 9,000 linear feet of sewer separation has been completed. This separation program is scheduled for completion early in the spring of this year. The sanitary phase will be connected immediately to the Metropolitan Sanitary District interceptor sewer system.

The standard pickle liquor waste will be eliminated from this operation in the not-too-distant future.

In fact, construction of new facilities using the hydrochloric acid procedure with acid regeneration was begun November 15, 1965. This first phase of a three-phase program will be completed by the end of 1967, with work on the picklers themselves commencing in the third quarter of 1966. Such a program should eliminate waste from the pickling process, such as spent acid and ferrous compounds, from reaching the Little Calumet River.

However, a new program using coagulants has been set in motion also in recent months. The coagulant treatment procedure is similar to the program initiated at the Chicago Interlake Steel Plant where reductions for COD reached 94 per cent; suspended solids 89 per cent; and BOD 91 per cent. Equivalent reductions are expected at the Riverdale Plant. The actual pounds of waste removed from the river are now being fully evaluated.

(5) Republic Steel Corporation, Chicago, Illinois

All sanitary and coke plant wastes at this plant are discharged to Sanitary District sewers. A long list of industrial waste control facilities are in operation, which will be reported upon by a representative of Republic Steel Corporation.

(6) Ford Motor Company, Chicago, Illinois

This industry will report on recent additions to its waste handling facilities since they have had a particularly active program for the last 18 months. The entire contract for the treatment of this company's wastes is scheduled for completion by May 16, of this current year, 1966. More than two-thirds of the overall program has already been completed.

Our fifth speaker will be from the Ford Motor Company. This industry will report on recent additions.

Now as to the smaller plants, and I don't mean as to size but as to their contributing factors:

(7) General Mills, Chicago, Illinois

General Mills has installed a sewer extension to the interceptor system which prevents its process waste water from reaching the river. The installation of the sewer has resulted in the elimination of 16,300 lbs. of COD per day from 16,465 to 165 lbs and 1,500 lbs of BOD per day from 1,535 to 35 lbs. A check of the plant's cooling water discharge confirmed its excellent quality.

(8) Cargill, Inc., Chicago, Illinois

This industry has completely removed the discharge of its process water from the river. These new facilities were completed in March 1965.

(9) Allied Chemical Company, General Chemcal Division, Chicago, Illinois

This company is in compliance with the minimum requirements of the Sanitary District and presently does not constitute a problem.

(10) Bulk Terminals Company, Chicago, Illinois

This plant is tributary to Calumet Lake and operates a blending and storage of liquids facility. This operation is quite small, with a very small discharge. However, it has installed an oil separator and an extended aeration package plant which handles the domestic wastes.

(11) Catalin Corporation, Calumet City, Illinois

Since the latter part of July 1965 this plant has separated its process wastes and cooling water. The newly constructed facilities should prevent all industrial wastes from reaching the river. A recent reevaluation of effluent shows major improvement of quality.

(12) Chicago Brick Company, Chicago, Illinois

The former discharges from this plant are now directed to a central location from whence the waters are reused, thereby eliminating the former discharge completely.

Colonel F. W. Chesrow

(13) United Chemical and Organic Products Co., Calumet City, Illinois

This plant is completely connected to the sanitary sewer system. On occasion in the past an inadequate grease separator had caused spillage to the river. A new grease recovery facility will be completely installed by June, of this current year, 1966. However, at this time good housekeeping is preventing any discharge to the river.

(14) Swift and Company, Calumet City, Illinois

This plant discharges its wastes to a lagoon, and there is no overflow to the Calumet River.

(15) Spencer Chemical Company, Calumet City,

This plant's process water enters a lagoon facility with no overflow to the stream except for its separated cooling water which is of good quality.

(16) Libby, McNeil and Libby, Blue Island, Illinois

The waste discharges from this plant now enter the Sanitary District interceptor sewer system.

In summation, of the 16 plants in the Metropolitan Sanitary District within the Calumet Region, nine have solved their problems, most of which contribute no discharge. The seven remaining plants have also shown considerable progress, particularly in recent months.

Such progress would not have been possible if it were not for a concentrated effort of our industrial waste group under the able direction of Dr. Kaplovsky and the excellent cooperation of industry.

I would like to take this opportunity to present to you Dr. Kaplovsky, whom I called to this table. He is, incidentally, the Sanitary District's Technical Adviser on your technical committee.

Our program of being factual, fair and firm has been recognized and accepted by our industrial establishments as a way of getting things done. The progress made is ample evidence of accomplishment. Much has been achieved; however, much has yet to be completed involving some of the more difficult phases associated with the total clean-up program. We recognize the complexity of the problem but we must never lose sight of the ultimate goal.

FUTURE NEEDS AND OPERATIONS

After an industrial, municipal or other discharger has been informed of permissible loadings to the waterways, the discharger shall:

1) Submit within 60 days a detailed preliminary report and timetable for Metropolitan Sanitary District approval, setting forth the

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period for preparing plans and specifications for construction of pollution abatement facilities.

2) After approval of detailed plans and specifications, adhere to these plans, specifications and construction timetable schedule established by the regulatory agency.

RECOMMENDATIONS TO CONFERENCE

In conclusion, we recommend to the conference that:

FIRST: Every effort should be expended to insure that the water quality of Lake Michigan be improved and maintained at a level consistent with the highest water use quality.

SECOND: No wastes from Indiana into Illinois be permitted which would add a pollution load and dilution water requirements on Metropolitan Sanitary District waterways.

THIRD: Every effort should be made by each conferee to expeditiously formulate a specific schedule for compliance.

(Enclosures A, B and C to the presentation of Colonel Chesrow follow:)

ENCLOSURE "A"

THE METROPOLITAN SANITARY DISTRICT
OF GREATER CHICAGO

August 18, 1965

Mr. A. R. Bakaitis, Gen. Mgr.
Mr. M. Foreman
Bulk Terminals Co.
12200 South Stoney Island
Chicago, Illinois

Gentlemen:

The Metropolitan Sanitary District of Greater Chicago is charged with the responsibility of implementing a program designed to prevent new pollution and reduce existing pollution. It is our wish to carry out this charge effectively and expeditiously and with reasonableness. We solicit your fullest cooperation.

In March of this year a Conference was called by the U. S. Department of Health, Education, and Welfare with regard to Interstate pollution in the Calumet region. One of our primary concerns is the protection of our Lake front and water supply. The importance of protecting these irreplaceable assets is self-explanatory.

The problem of reducing existing pollution and preventing new pollution in this area is understandably difficult, involving several governmental agencies, a concentration of diversified industry, and complex water currents and movement. The conference has served as a team with one objective, namely, to get difficult job done as quickly as possible. The Conferees, the Indiana Stream Pollution Control Board, the Illinois Sanitary Water Board, and the Metropolitan Sanitary District of Greater Chicago, are moving toward a common goal by working under similar guidelines set forth at the Conference and approved by the Secretary of HEW in each of their respective areas of jurisdiction. In this way a complex pollution problem of long standing is being attacked on all fronts simultaneously.

Section 12 of the Conclusions and Recommendations of this Conference states -- "The Indiana Stream Pollution Control Board, the Illinois Sanitary Water Board, and The Metropolitan Sanitary District of Greater Chicago, maintaining close liaison with the technical committee created by the Conferees will develop a time schedule for the construction of necessary industrial waste treatment facilities. Such a schedule will be submitted to the conferees for their consideration within six months after the issuance of the summary of this conference."

The Metropolitan Sanitary District of Greater Chicago directs your company to develop, for our review and approval, a time schedule for the construction of necessary industrial waste treatment facilities to accomplish the following minimum requirements:

(1) Complete removal of all settleable solids as defined and measured in "Standard Methods for the Examination of Water and Wastewater, Eleventh Edition."

(2) Effluent pH range between 5.5--8.5.

(3) Substantially free of visible floating oil.

(4) Good housekeeping practices shall be standard for all operations.

(5) Substantially free of floating solids.

(6) Whenever feasible, available municipal sewers should be used for domestic and process wastes containing NH_3, phenol, CN and toxic constituents. Such sewer discharges must conform with requirements of our 1962 Industrial Wastes Ordinance.

A schedule of construction to accomplish these minimum requirements shall be submitted no later than October 1, 1965. Results from additional stream study in the near future and the adoption of water use criteria may require further constituent removals in some instances. Such requirements will be transmitted as soon as possible. A sampling and effluent measurement program for industry will follow shortly.

If you have any questions, please feel free to contact my office at once. Again, we solicit your fullest coopertion and assistance.

Very truly yours,

Frank W. Chesrow, President

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ENCLOSURE "B"

The Metropolitan Sanitary District of Greater Chicago

Calumet Region

Stream Surveillance Program

SAMPLING STATION LOCATIONS

As of January 3, 1966

1) Ewing Avenue

   Calumet River

2) 106th Street

   Calumet River

3) Torrence Avenue

   Calumet River

4) 130th Street

   Calumet River

5) Torrence Avenue

   Grand Calumet River

6) Indiana Avenue

   Little Calumet River

7) Halsted Street

   Little Calumet River

8) 131st - Ashland

   Calumet Sag Channel

9) Ashland Avenue

   Little Calumet River (Branch)

10) Indiana - 152nd Street

Little Calumet River (Branch)

11) 126th Street at Dam

Wolf Lake Ditch

12) Carondolet Road

Wolf Lake Ditch

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ENCLOSURE "C"

THE METROPOLITAN SANITARY DISTRICT
OF GREATER CHICAGO

October 14, 1965

Mr. N. J. Klipfel
General Mills, Inc.
10459 Muskegon Avenue
Chicago, Illinois

Dear Mr. Klipfel:

In our letter of August 18, 1965, minimum waste control requirements were set forth wherein industry in the Calumet Region was directed to submit by October 1, 1965, a time schedule for the construction of necessary waste treatment facilities to comply with these requirements. This letter also stated a sampling and effluent measurement program for industry would follow.

An integral part of the overall effort to obtain and maintain stream and lake water quality within our area in the best interests of the public is the need for basic information on the total constituent loading to our waterways. Accordingly, the Conferees incorporated Section 11 as part of the Recommendations and Conclusions adopted at the conference held in March of this year, pertaining to pollution within the Calumet Region. This section stipulates that the Metropolitan Sanitary District of Greater Chicago will undertake action to insure that industrial plants discharging wastes into those waters within its jurisdiction will institute a program of sampling their effluents to provide information in carrying out its functions. It is further stated that such information will be maintained in open files by this Agency for those having legitimate interest in the information. The need and direction is clear.

In order to determine constituent loading the composition and volume of each discharge must be measured. However, the analytical measurements of the numerous constituents present are being reduced a minimum consistent with the type of wastes, industry location, and significance of individual constituents. In short, it is realistic and reasonable to consider a case by case evaluation. Understandably, representative sampling of intakes and discharges must be accomplished before performing the analyses designated on the attached form. Stream loadings must be reported on a 24-hour basis. Therefore, representative sampling followed by the required analyses must be correlated with waste volume.

The frequency of sampling will, of necessity, be dictated by the process and variation of operation. In addition, the number of samples required as a basis for design of new facilities or the control of existing treatment units will differ from plant to plant and discharge to discharge.

The primary objective is to obtain representative stream loading data which shall be submitted to the Metropolitan Sanitary District monthly. After a sufficient period of measurement has elapsed whereby consistency of data becomes evident, the frequency of sampling each intake and discharge will be firmly adopted.

Analyses as designated on the attached form are to be performed according to "Standard Methods for the Examination of Water and Wastewater," Eleventh Edition published by the American Public Health Association. Analytical procedures of proven accuracy and precision not listed in Standard Methods may be used as alternates subject to approval by the Metropolitan Sanitary District of Greater Chicago.

Monthly reports, as per attached form, shall be submitted the fifteenth of each month commencing with November, 1965. Include with the initial submission a sketch designating each intake and discharge location by number or letter and the location of existing and/or proposed waste treatment facilities.

It is our desire to assist in every way possible. Since we are obligated to periodically check all waste discharges we will work closely with each of you so that this need will proceed as a truly cooperative program.

Thank you for your continued cooperation with our program.

If you have any questions, please feel free to contact my office at once.

With best wishes, I am

Sincerely,
The Metropolitan Sanitary District of Greater Chicago
Frank W. Chesrow, President

FWC:t

Enc.

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COLONEL CHESROW (Continuing): Before calling on the first of our speakers from industry, I would like to take but a minute to thank the village fathers of our Indiana neighbors, East Chicago, Hammond, Gary and the other cities and communities in Indiana, for working with us toward a common goal, that of restoring Lake Michigan, that great God-given inheritance that has been entrusted to us, not to destroy but to enjoy today and preserve for future generations.

MR. STEIN: Thank you, Colonel.

Are there any comments or questions?

(No response.)

I want to thank you very much, Colonel, for a very full statement. I too have been familiar with Dr. Kaplovsky when he was back in Delaware. I know you are all indeed fortunate in having him out here.

Dr. Kaplovsky is a top engineer, which I think is reflected in the statements and very constructive approach of the District.

COLONEL CHESROW: Thank you.

I would like now to call upon Mr. Herbert J. Dunsmore of U. S. Steel. Incidentally, Mr. Dunsmore is a Diplomate of the American Academy of Sanitary Engineers and has worked as a Public Health official, so I think we can say he speaks with authority.

Mr. Dunsmore.

STATEMENT OF
HERBERT J. DUNSMORE,
ASSISTANT TO ADMINISTRATIVE VICE PRESIDENT,
ENGINEERING,
UNITED STATES STEEL CORPORATION

MR. DUNSMORE: Mr. Chairman, Conferees, and ladies and gentlemen:

I am Herbert J. Dunsmore, Assistant to the Administrative Vice President, Engineering, United States Steel Corporation. I am appearing today as a witness for the Metropolitan Sanitary District of Chicago at the invitation of the conferee, Colonel Chesrow.

Today, ten months after the conference on the Calumet and related rivers, we welcome this opportunity to make a report on water conservation progress at our United States Steel Corporation's South Works.

Half of our water intake from Lake Michigan currently goes to the power stations for condenser cooling. This water picks up no waste and is returned to the lake without pollution.

The other half of our water intake is distributed throughout the plant for cooling and cleaning the steelmaking processes.

(The following presentation was made with slides.)

Water pollution abatement is a top management responsibility at South Works. Here Bill Millar and other top superintendents of our various divisions of the South Works regularly make an inspection of the plant which includes the inspection of this No. 7 outfall.

BLAST FURNACE FLUE DUST

South Works has 11 blast furnaces. Cleaning the gases from these furnaces results in a lot of dust laden water which flows to the twin 160-foot diameter thickeners, shown here.

Today's iron production places a greater load on the dust control system than when it was originally installed, and despite the fact that our operating practices now produce less dust per ton of iron, this elaborate control system is unable to capture all of it. New pumps have been purchased and will soon be installed to improve the efficiency of our present thickeners.

What is more important, preliminary engineering plans have been completed for additional thickeners which will greatly enhance the efficiency of flue-dust removal at South Works.

MILL SCALE RECOVERY

The 34" structural mill which started production in 1960 permitted us to incorporate efficient water conservation equipment as an integral part of new South Works facilities. This mill is one of the cleanest in the industry.

Hot steel oxidizes rapidly and the scale must be removed before it is rolled. This is done by directing water sprays on the hot metal just before it enters the scale breaker rolls.

A water flume carries all scale from the five stands of rolls on the 34" mill to this 220-foot long scale pit where the scale is removed mechanically.

In all, 27 pits serve to keep the scale generated on South Works' nine rolling mills out of the lake. They and other types of facilities you will see today represent considerable investment and maintenance to us and this gives us a double incentive to make the best use of them.

WASTE OIL RECOVERY

All effluent water from the rolling mill scale pits undergoes a skimming operation before it leaves the plant.

A sump is provided to receive the effluent water from the scale pits. Its purpose is to retain the water before discharge and permit that portion of the oil that escaped the scale pits to float. The floating baffle which also serves as a walkway traps most of the remaining oil. Any oil that escapes the sump and is discharged with the effluent is recovered by this traveling belt just installed in the north slip. Plans are also under way for the installation of belt skimmers at other discharge locations.

SPENT PICKLE LIQUOR DISPOSAL

Spent pickle liquor is the waste product of the sulphuric acid solution used to remove iron oxide scale from steel prior to finishing. Pickling, at South Works, is confined to a very limited range of products rolled on the alloy bar mill. The small amount of spent pickle liquor produced by this process is neutralized by lime in this batch neutralization pit.

CONTROLLING "POPCORN" SLAG

Molten slag from South Works' blast furnaces becomes a fluffy white material about the consistency of popcorn when quenched in water-filled pits. While most of it settles, there is some that floats.

Almost all of the slag is trapped in, over and under weirs and that which escapes the weirs is intercepted by these rotary screens incased in the rectangular boxes below the weirs.

These extremely abrasive slag particles make it very difficult to maintain these screens at top operating performance. As a result the screens are occasionally "down for repairs."

Process changes are helping to bring this problem under control by decreasing the volume of popcorn slag. The volume of popcorn slag will be further reduced early next year when the relining of No. 10 blast furnace is completed. All of the slag from this furnace will be air-cooled in the dry pit shown under construction. The two pits permit removal of dry slag from one while it is cooling in the other. Shown in the center background is the No. 10 blast furnace.

SANITARY WASTES

South Works built a separate sewer system for sanitary wastes in 1924 and enlarged it several times as the plant grew. At the present time a 15-mile network of sewers, ranging from six to 36 inches in diameter, delivers all South Works sanitary wastes to the Metropolitan Sanitary District. Separate storm sewers discharge such waters directly into Lake Michigan and Calumet River.

Herbert J. Dunsmore

MONITORING PROGRAM

Stairs and platforms like these were constructed at outfalls where it was necessary to take samples.

These technicians are members of the South Works team who regularly take outfall samples and make flow determinations. They are shown here obtaining an effluent sample from the No. 10 outfall as part of a composite sample for laboratory analyses. The determination of discharge quantities is necessary.

Here South Works technicians lower a Gurley velocity meter into the No. 10 sewer to measure flow for volume determination. These samples and flow measurements, reported monthly to the Chicago Sanitary District, guide the direction of South Works' water conservation program.

Here a chemist is shown analyzing an outfall sample. Such analyses as these form the basis for South Works' reports to the Metropolitan Sanitary District of Greater Chicago.

WORKING WITH THE SANITARY DISTRICT

South Works' representatives participated in the formulation of the Metropolitan Sanitary District's industrial waste ordinance which was passed in 1962, and have cooperated fully with the district both before and since the ordinance was passed. We are presently working closely with them as reported by Colonel Chesrow.

Preliminary plans are being developed for further treatment where necessary of waste water at South Works. This is long-range and must be coordinated with the rehabilitation of other facilities. This could involve costly rebuilding and relocating of many miles of plant sewers.

As an immediate step toward water quality improvement, studies are being made with the Sanitary District to determine the feasibility of discharging some of the wastes containing small concentrations of ammonia and phenol into the municipal sewage system.

As reported by the Metropolitan Sanitary District, pumps have been purchased and installed which substantially improved the removal of flue dust solids from blast furnaces No.'s 10, 11 and 12.

Engineering work is under way on waste treatment facilities to remove flue dust solids from the remaining blast furnaces. The new flue dust thickener or thickeners needed are planned to be located near the north slip where the effluent will be discharged into the Calumet River. It is anticipated that detailed engineering work, which is complicated by the crowded condition on the plant property, will be completed in the second quarter of 1966. At that time dates for authorizing and completing this construction program can be established.

Preliminary plans have been completed which propose to intercept sewers No.'s 2, 4, 5, 8, 9, 10, 13 and 14 and bring them to a common terminal point where their waste can be satisfactorialy treated before being discharged. Extensive study is actively under way to determine the most effective means of accomplishing this in accordance with the other important changes in production facilities that must be accommodated in the next five years.

As was shown earlier and referred to by Colonel Chesrow, one oil skimmer has been installed on the north slip. Additional oil skimming equipment will be obtained in 1966 for other areas where its use is determined to provide an effective means for oil removal.

Improved housekeeping practices have been instituted throughout the plant with particular attention to preventing oil and solids from gaining access to the waste discharge system. This practice includes regular scheduling of cleaning scale pits and inspection of solids removal facilities. This practice will be continued through instituting an inspection program and improved maintenance practices.

Let me emphasize again that considerable improvement has been effected in the removal of floating solids from popcorn slag area through improved maintenance of the slag pits and retaining devices at the point of discharge.

In closing I wish to thank Colonel Chesrow for the opportunity to review South Works' pollution abatement program at this meeting.

MR. STEIN: Thank you, Mr. Dunsmore.

Are there any comments or questions?

(No response.)

If not, thank you very much.

Off the record.

(Discussion off the record.)

MR. STEIN: Colonel Chesrow.

COLONEL CHESROW: Next Mr. Louis F. Birkel, Waste Control Engineer of Republic Steel.

Louis F. Birkel

STATEMENT OF

LOUIS F. BIRKEL, WASTE CONTROL ENGINEER,

REPUBLIC STEEL CORPORATION

MR. BIRKEL: Mr. Chairman, Conferees:

My name is Louis F. Birkel, and I am staff engineer in charge of Republic Steel Corporation's waste control program. My offices are in Republic's Research Center in Independence, Ohio.

I appreciate very much the opportunity to present a statement to this conference outlining the steps we have taken, are taking and will take in the near future to maintain the necessary water quality for the best use of the Calumet River.

Water pollution control has been and will continue to be of prime concern to us at Republic Steel. We are working closely with appropriate city, county and State agencies to develop realistic and workable solutions to control problems at all of our steel plants, including our South Chicago operations.

At South Chicago we have spent more than $2-1/2 million for pollution abatement facilities since 1958, and we are planning an expenditure of more than $500,000 for complete waste treatment facilities on a new 14-inch bar mill presently under construction at the plant.

I would like to outline the specific steps we are presently taking along with our future waste control plans at Republic's South Chicago plant.

In order to familiarize the conferees with our South Chicago operations I would like to describe briefly our facilities at the 116th and South Burley Avenue plant. This plant employs 6,000 persons and is located three miles upstream from Lake Michigan on the Calumet River. It is Republic's third largest basic steel plant and produces approximately 15 per cent of Republic's total steel production annually.

Our South Chicago plant occupies a 676-acre site and in 1965 produced more than 1,620,000 ingot tons of steel.

The South Chicago plant converts steel's basic raw materials into all forms of semi-finished products as well as finished bar and wire products and seamless tubing. To do this, the plant has one 28-foot diameter blast furnace, a 75-oven coke plant and necessary by-product facilities, eight electric arc steelmaking furnaces and four open hearth furnaces, a ladle vacuum degassing unit, blooming and billet mills and the necessary steel conditioning facilities. The plant's finishing mills include a 10-inch combination bar and rod mill, 11-inch bar mill, 12-inch bar mill, seamless tube mill, wire mill and other associated facilities.

For the orderly movement of materials these facilities are arranged in a north and south direction in a narrow strip of land along the Calumet River. Raw materials enter at the blast furnace on the north end of the plant and are processed through intermediate areas to the finishing area at the south end of the plant. There are seven outfalls to the river serving these areas, one of which discharges only cooling water from the open hearth and electric furnaces. Another carries surface drainage only.

I might add that the five outfalls are equipped with measuring flumes and automatic sampling stations.

Wastes at Republic's Chicago plant may generally be divided into five broad classifications: Blast furnace flue dust, mill scale and oil, spent pickle liquor (acid), coke plant wastes and sanitary wastes. These wastes are described by their characteristics rather than by geographical location in the plant. Because all of the Chicago plant's sanitary wastes are discharged directly into Chicago Sanitary District sewer lines and none go into the Calumet River, I will confine my remarks to the first four classifications only.

At our blast furnace solids are removed by various devices. This follows pretty much the schemes you saw yesterday from U. S. Steel's basic oxygen process. The solid-bearing water from the washer and precipitator is collected and discharged to a thickener. A travelling screen in the inlet trench to the thickener is provided to screen out granulated slag and other materials which would possibly float out or clog the pumps. The thickener itself is 105 feet in diameter and provides more than four hours retention. It is equipped with the necessary appurtenances including mechanical scrapers, a slurry pumping system and a vacuum filter for sludge de-watering.

Provisions also are made to pump slurry to the pug mill at our sinter plant, both as a standby and to utilize the solids without filtering. To further reduce the possibilities of bypassing, a line from the thickener to an ore dock settling pond was constructed last summer so that in the event of an emergency, the slurry would be pumped to the ore dock instead of the river. We also have been studying means to further increase the efficiency of these facilities just described.

In the production of hot steel products, scale is formed which drops into a flume and is carried by water to a sedimentation tank. At this point I wish to emphasize that our oil losses at this plant are limited to those that inadvertently get into scale-bearing wastes from the lubrication systems.

We do not have a cold mill complex here with the attendant large oil usage and emulsified oils.

We have a total of 16 sedimentation tanks in operation for scale and oil recovery. In some of the older installations the basins have been modified to increase the efficiency of the scale and oil removal. At the ten-inch and 11-inch mills, an automatic scale recovery system was installed. In addition, investigation is proceeding on automatic scrapers for installation in the 44-36-32-inch mill scale pits to further increase the efficiency of oil and scale removal.

Within the last six months oil recovery in the 11- and 10-inch mill areas has been improved by the installation of a new belt-type skimmer which automatically removes the oil to storage tanks for disposal. In addition, a similar unit is being engineered for the 34-inch mill sedimentation tank. It is expected to be in operation later this year.

We presently are constructing a new 14-inch bar mill at the South Chicago plant as mentioned earlier.

Louis F. Birkel

The 14-inch mill's pollution abatement facilities are in the design stage and will consist of two scale pits with automatic oil and scale removal. Effluent from these pits will be recycled for scale flushing water on the mill. A complete water treatment plant will also be constructed to treat a portion of the scale pit effluent to provide a higher quality water for certain uses in the mill.

All cooling water for the furnaces, compressors and other facilities will be segregated in a separate system, passed through cooling towers, and continuously reused. Blowdown from this system will be to the mill scale system. Although the water requirements for the mill will be in excess of 8,000 gallons per minute, the discharge will be limited to 300-400 gallons per minute of coagulated and clarified effluent.

The new 14-inch mill, together with its treatment facilities, will be in operation in 1967. This design will provide more stringent treatment than generally accepted requirements we can see in the future. However, Republic has accepted the additional cost of this design due to the impracticability of adding facilities after the mill is constructed and in operation.

As an additional source of water for this area, feasibility studies are being conducted to determine if the water from the 10-, 11- and 12-inch mills now being discharged to the river can be recycled back to those mills as well as to provide makeup water for the 14-inch mill.

To reduce the amount of pickling required at the plant, four wheelabrators have been installed. These are units designed to remove scale by grit blast cleaning, thereby replacing acid. They have been installed as replacement for acid picking for the 11-, 12- and 32-inch mills. The units are all in operation, and it is estimated dry cleaning has reduced our acid usage by 65 per cent. Studies are being made to determine methods to reduce or eliminate the remaining acid.

Operation of the 75-oven coke plant is continuous on a 24-hour daily schedule. The only discharge from the coke plant to the river is cooling water which does not come in contact with waste streams.

Waste waters containing ammonia, cyanides and phenols are pre-treated before discharge to the Sanitary District sewer system. The following review of the operating steps may be helpful: Gases, after leaving the coke ovens, are initially cooled with sprays of flushing liquor. Flushing liquor and primary cooler condensate drain to two decanters that are in parallel for gravity separation of tar and liquor. Three indirect primary coolers with service water through the tubes and gas passing around the tubes are employed. There is no contact with this cooling water, and it is discharged through the No. 7 outfall.

Phenol is recovered from the raw ammoniacal liquor by countercurrent extraction with benzol. Phenol is recovered from the benzol extraction as sodium phenolate by extraction with caustic soda solution. Ammonia is recovered by the semi-direct process as ammonia sulfate.

Gas final cooler water is recirculated in a closed system through a napthalene separator and then through a cooling tower. Evaporation losses exceed the quantity of water condensed from the gas. Napthalene is condensed from the cooled gas, and it is continuously removed from the gas final cooler water.

Before closing I would like to make it clear that we have a continuing program for scale removal and the cleaning of scale pits at our South Chicago operations as well as a constant program to detect any possible oil leaks. These operations are checked monthly by the plant's Engineering Department and a report is made to the District Manager to insure that good housekeeping practices constantly are being followed.

In addition, I wish to emphasize that all new operating units at the plant will include waste treatment facilities in their initial construction to comply with the most stringent requirements that we can foresee. Meanwhile, we are constantly reevaluating our existing facilities to achieve further reduction in any waste discharge.

Republic Steel's South Chicago plant has and will continue to cooperate with the Metropolitan Sanitary District.

MR. STEIN: Thank you, Mr. Birkel.

Are there any comments or questions?

Mr. Poston.

MR. POSTON: I don't have any questions.

MR. STEIN: I would like to thank you very much, Mr. Birkel.

You know Louis used to be a bureaucrat, although a State bureaucrat. Sentiment and professional courtesy would preclude us from making any sharp comments or asking any nasty questions, but on the last comment, "has and will continue to cooperate with the Metropolitan Sanitary District," you know Republic has said that for years, and you collaborate with the State and the Sanitary District. I guess if we want to hang around long enough one time you might say you might cooperate with the Federal government.

Look how far Youngstown Sheet and Tube has come. (Laughter)

Don't slight us.

MR. BIRKEL: I didn't mean to slight you. I still understand we report to Colonel Chesrow and Dr. Kaplovsky and not to Murray Stein.

COLONEL CHESROW: Thank you, Mr. Birkel.

MR. BIRKEL: Thank you.

COLONEL CHESROW: Mr. J. H. Miller, Chief Engineer, Wisconsin Steel Division of International Harvester.

J. H. Miller

STATEMENT OF
J. H. MILLER, CHIEF ENGINEER,
WISCONSIN STEEL WORKS,
INTERNATIONAL HARVESTER COMPANY

MR. MILLER: Mr. Chairman, Conferees, ladies and gentlemen:

I am J. H. Miller, Chief Engineer for the Wisconsin Steel Works of the International Harvester Company.

This mill is located on the Calumet River between the O'Brien Lock and Lake Michigan.

At Wisconsin Steel Works of the International Harvester Company our ultimate aim is to eliminate all outfalls to the Calumet River by eliminating contaminants in our process water and reuse of that water. At the present time our progress toward this goal has led to the elimination of 94 per cent of the suspended solids formerly carried to the river by process water, as well as the elimination of 45 per cent of the water formerly going to the river. Our plant is a completely integrated steel mill and one of the oldest in the Calumet area. Therefore, it is apparent from the above remarks that our program has been in existence for some time.

Considerable training and education of all personnel and expenditures of large sums are necessary to

J. H. Miller

change practices that once permitted any and all wastes to go to the sewers and thence to the rivers to one wherein all must realize that what now goes to the sewers will be returned to them in the form of recirculated process water.

Since 1958 there has not been an item of new construction that did not take into account the fact that no water would be allowed to return to the river. Therefore, no additional outfalls were built, whereas, present outfalls have been reduced in number from 13 to five. Water is reused by settling and skimming, and our major contaminant today is temperature.

Some 35 years ago our sanitary sewers were separated from process water sewers. Ammonia liquor from the coke plant is discharged to the sanitary sewers along with the discharge from other sanitary facilities.

In 1945 we installed our first thickener to reclaim flue dust and prevent its eventual shoaling in the Calumet River. The removal of this material was costly, and there was no value to the recovered mixture.

In 1958 plans for a new merchant mill requiring process water for cooling and for scale washing was engineered, and it was decided that this mill would have no connection whatsoever with the Calumet River. The only sewer connection serving this mill is a sanitary sewer connected to the Metropolitan Sanitary District system.

This mill has been in operation since 1961 and has demonstrated that it is possible to operate a rolling mill without returning contaminated water, or any water for that matter, to nearby waterways. We take makeup water only from the Calumet River and, by the use of a cooling tower, recirculate our furnace cooling water. By means of the usual scale settling basin, the mill scale is washed down, settles out, and the water is returned by pumping to the mill stands for further use.

Figure 1, please.

(The following presentation was made with slides.)

The portion colored in yellow illustrates our general plant layout. Please note the location of our No. 6 mill in the upper right-hand corner. There is no connection from this mill to the old mill or to the Calumet River without crossing the property of others. This mill is completely isolated and is the mill I just referred to where we learned that we could recirculate all mill water and operate without returning any water to the river.

J. H. Miller

The older portion of the plant is this portion where the blooming mill and the two pumphouses and the thickener are shown.

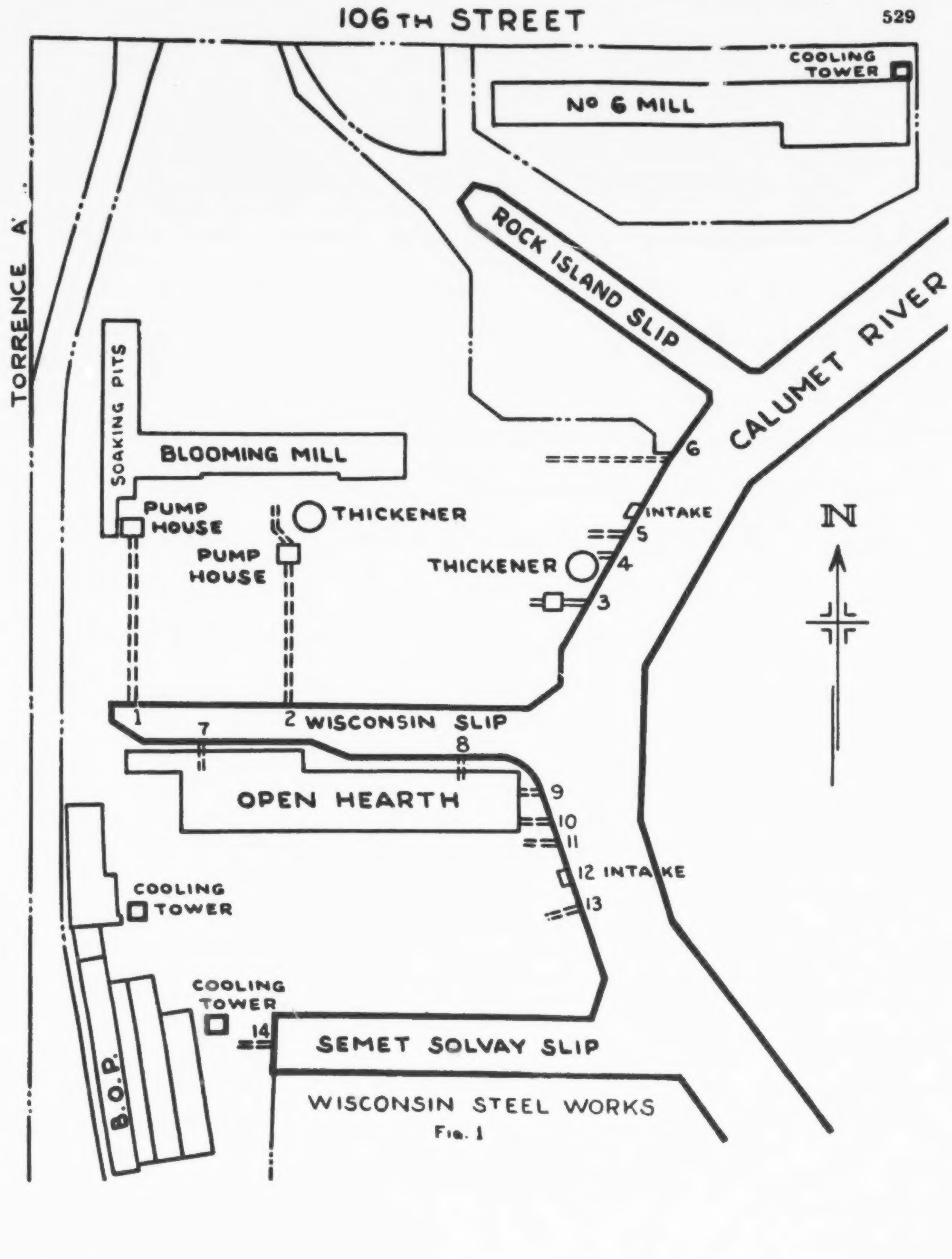
There are also shown six outfalls to the river and a water intake.

This section of the plant has its own water system, although the line that feeds makeup water to No. 6 mill comes from this system.

South of the Wisconsin slip is a part of the plant containing the open hearth and coke plant and now the new steelmaking facilities.

We show here the location of cooling towers which enabled us to recirculate water there.

(Figure 1 follows:)


106TH STREET
COOLING TOWER
No 6 MILL
TORRENCE AV
ROCK ISLAND SLIP
CALUMET RIVER
SOAKING PITS
BLOOMING MILL
PUMP HOUSE
THICKENER
PUMP HOUSE
6
INTAKE
5
THICKENER
4
3
N
1
2
WISCONSIN SLIP
7
8
OPEN HEARTH
9
10
11
12 INTAKE
13
COOLING TOWER
COOLING TOWER
14
SEMET SOLVAY SLIP
B.O.P.

WISCONSIN STEEL WORKS

Fig. 1

J. H. Miller

Slide 2, please.

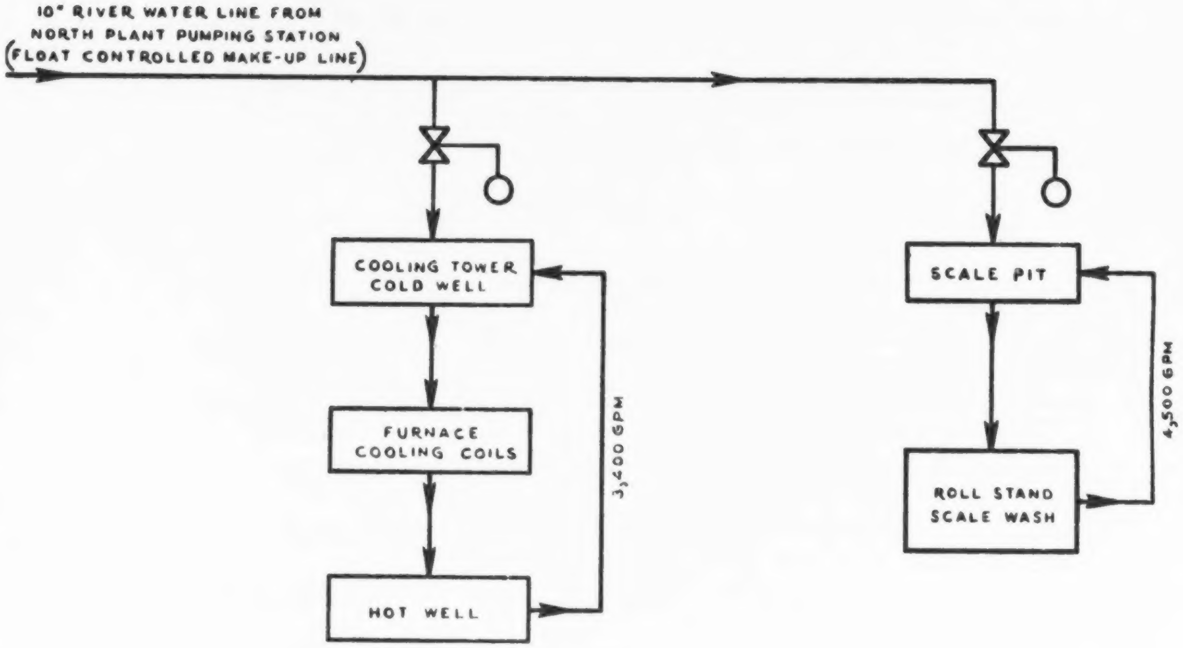
This is the connection of our piping and the general schematic of the way we work No. 6 mill. The makeup line is at the top of the paper, and a flow valve controls the water to the cooling tower cold well to keep it at a good level.

3400 gallons per minute of water are recirculated through the furnace-cooling coils over a cooling tower and return over and over. This water is treated somewhat similarly to boiler water.

On the far right the mill water is controlled in the same manner by a flow valve. The scale is washed in the mill stands to the scale pit where it is skimmed, oil is recovered, and the scale is also settled out. The water is pumped again to the mill stands and reused.

You would be surprised how dirty this water can get and still be of value to us.

(Figure 2 follows:)


10" RIVER WATER LINE FROM
NORTH PLANT PUMPING STATION
(FLOAT CONTROLLED MAKE-UP LINE)
COOLING TOWER COLD WELL
FURNACE COOLING COILS
HOT WELL
3,400 GPM
SCALE PIT
ROLL STAND SCALE WASH
4,500 GPM

NO. 6 MILL RIVER WATER RECIRCULATING SYSTEM

FIG. 2

J. H. Miller

Lights, please.

Our original thickener in the old plant, which had been primarily used for blast furnace flue dust, became too small as blast furnace production increased, even though the use of pellets lowered the dust rate. Additional thickener capacity was needed and it was felt that, with some additional expense, we could recirculate and reuse water north of the slip as in No. 6 mill.

Therefore, in 1964 a second thickener was added which allows us to collect all flue dust and mill scale north of the Wisconsin slip. As part of this thickener installation our sewer system was redesigned, sewers were interrupted, their flow to the river blocked, and the contaminated water was pumped to both old and new thickeners. Sludge from the thickeners is routed through the filter house,thence to the sintering plant and blast furnaces; the clear water overflow is piped to the pumping station intake and reused. This system has been in operation almost two years and resulted in the elimination of 94 per cent of [redacted]d 75 per cent of our waste pickle liquor.

Where we had been pumping 98,000,000 gallons per day from the river in the north plant's once-through system, we now pump 60,000,000 gallons per day from the river and 38,000,000 gallons per day are cleaned and reused without going to the river.

Figure No. 3, please.

This is a schematic diagram of this system showing that we formerly had six sewers discharging to the river from the old plant, whereas now there are only two. In the lower left we start numbering the sewers.

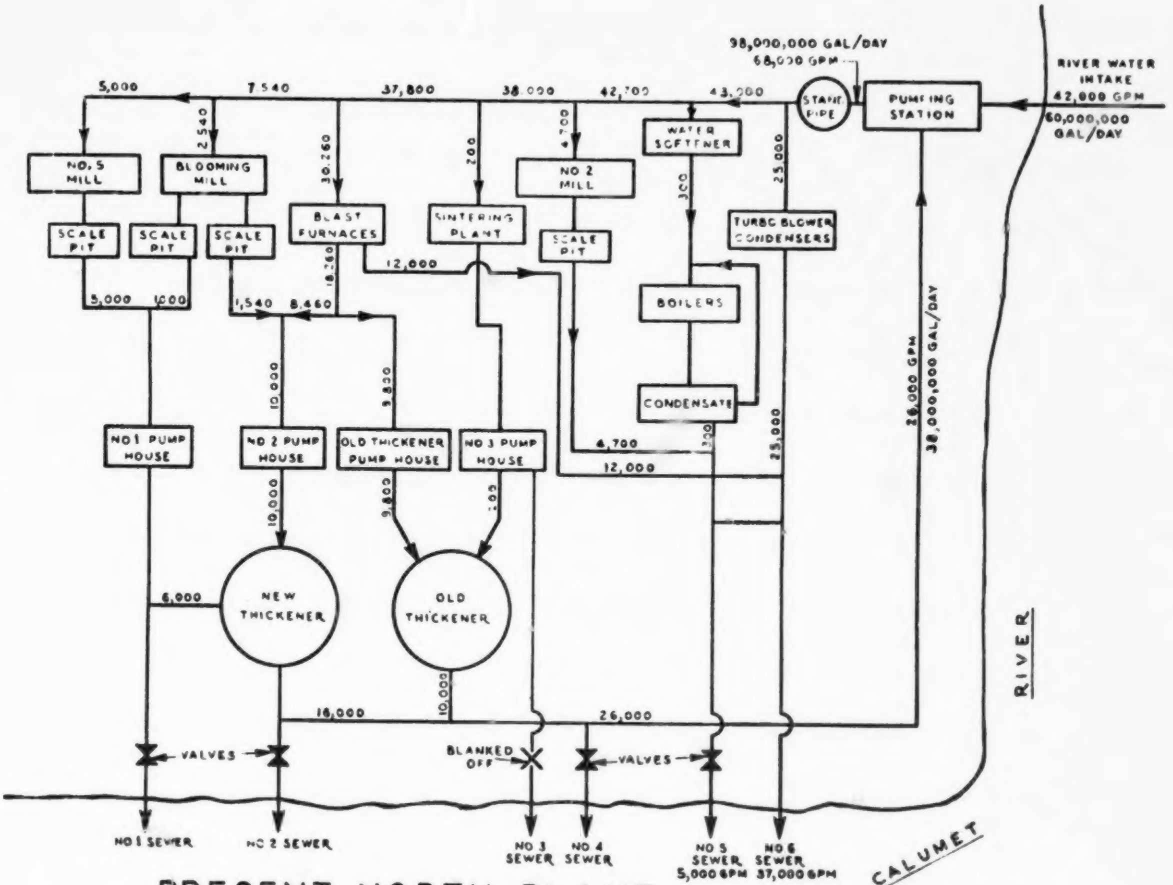
We show valves there at the present time because we have blocked the sewers 75 per cent. Until we thoroughly tested the system, we didn't want to flood anything and ruin some expensive equipment.

We now know that this system will work, and you will see No. 3 is completely blanked off because it had no chance to back up on any of our equipment.

There is a valve on No. 4. This valve, as you notice, is the valve from the new thickener and the old thickener. In case we were in trouble we could turn the water to the river. That valve has been closed for over a year and a half.

That line, as you notice, goes back to the pumping station, and all of the water there, the 38,000,000 gallons per day, is recirculated without having to go to the river.

(Figure 3 follows:)


98,000,000 GAL/DAY
68,000 GPM
RIVER WATER INTAKE
42,000 GPM
60,000,000 GAL/DAY
STAND PIPE
PUMPING STATION
5,000
7.540
37,800
38.000
42,700
43,000
2,540
30,260
200
4700
NO. 5 MILL
BLOOMING MILL
NO 2 MILL
WATER SOFTENER
300
25,000
SCALE PIT
SCALE PIT
SCALE PIT
BLAST FURNACES
SINTERING PLANT
SCALE PIT
TURBO BLOWER CONDENSERS
18,260
12,000
5,000
1000
1,540
8,460
BOILERS
CONDENSATE
26,000 GPM
38,000,000 GAL/DAY
10,000
9,820
NO 1 PUMP HOUSE
NO 2 PUMP HOUSE
OLD THICKENER PUMP HOUSE
NO 3 PUMP HOUSE
4,700
300
12,000
25,000
10,000
9,800
6,000
NEW THICKENER
OLD THICKENER
10,000
16,000
26,000
VALVES
BLANKED OFF
VALVES
NO 1 SEWER
NO 2 SEWER
NO 3 SEWER
NO 4 SEWER
NO 5 SEWER 5,000 GPM
NO 6 SEWER 37,000 GPM
CALUMET
RIVER

PRESENT NORTH PLANT
RIVER WATER SYSTEM

FIG. 3

J. H. Miller

Lights, please.

On October 11, 1964 our new basic oxygen steelmaking plant replaced our old open hearth steelmaking facility, which was shut down in February of 1965. This new plant is completely self-contained. Makeup water is drawn from the river and no water is returned to the river. All process water here is cleaned, cooled and reused. The discontinuation of the 11 open hearth furnace shop eliminated three more outfalls to the river immediately and during 1965, as a result of our tests requested by Mr. Chesrow, we discovered that a fourth outfall could be eliminated and this was recently filled with concrete.

Figure No. 4, please.

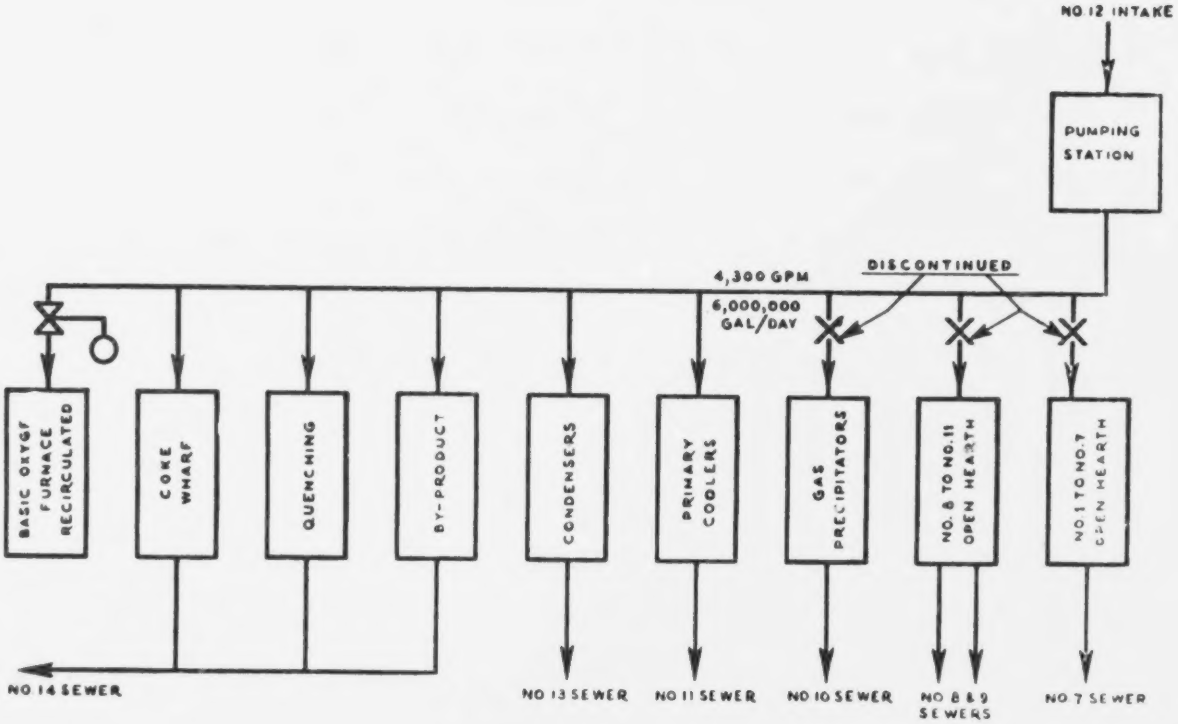
This is a schematic diagram of the south plant's system showing how the discontinuation of the open hearth furnaces eliminated four out of seven outfalls while adding a facility without a sewer connection to the river.

You will notice that No. 7, 8, 9 and 10 sewers have been closed off entirely. There is no activity in the open hearth whatever. The other sewers are for the coke plant.

On the extreme left the basic oxygen furnace plant is controlled as you notice again like No. 6 mill was with a flow valve, and all the water is recirculated.

There is no sewer connection whatever.

(Figure 4 follows:)


NO 12 INTAKE
PUMPING STATION
DISCONTINUED
4,300 GPM
6,000,000 GAL/DAY
BASIC OXYGEN FURNACE RECIRCULATED
COKE WHARF
QUENCHING
BY-PRODUCT
CONDENSERS
PRIMARY COOLERS
GAS PRECIPITATORS
NO. 8 TO NO. 11 OPEN HEARTH
NO. 1 TO NO. 7 OPEN HEARTH
NO. 14 SEWER
NO 13 SEWER
NO 11 SEWER
NO 10 SEWER
NO 8 & 9 SEWERS
NO 7 SEWER

SOUTH PLANT RIVER WATER

FIG. 4

J. H. Miller

Lights, please.

This change has reduced the load at the south pumping station from 22,000,000 gallons per day to 6,000,000 gallons per day, or a total plant reduction of river water usage amounting to 54,000,000 gallons per day.

Today we are in the process of constructing a continuous casting plant for casting steel billets. This plant will need process water for cooling and scale washing, all of which will be cleaned, cooled and reused. This plant will eliminate some of the water now used in the north plant, part of which is cleaned and recirculated, and will further help us to our ultimate goal of eliminating all outfalls to the river. The cooling tower at this location has been installed with a capacity large enough to handle water used in our degassing process, the construction of which has been planned for 1966.

As was pointed out several times when this conference was convened early in 1965, new mills were built with the proper equipment to prevent waterway contamination, whereas older mills were quite a problem. The International Harvester Company believes that by making changes as we go, we will eventually convert an old, long-established mill to a modern mill free of contaminated water to the river. We would again stress the fact that we are well in the midst of this program by repeating that we have eliminated 94 per cent of the suspended solids, 75 per cent of the waste pickle liquor, and 45 per cent of the water formerly returned to the river.

International Harvester stands ready to discuss the water pollution problem with all duly constitued government agencies, and is happy to cooperate at this time in working with the Metropolitan Sanitary District of Greater Chicago.

Gentlemen, if you will turn to the last page you will find the estimated additional costs to recent construction projects for the prevention of water pollution. These are appropriations completed or granted.

In other words, we are talking about things that are done and in use or are now under construction.

Thank you.

(The statement of costs referred to follows:)

Estimated Additional Costs To Recent Construction Projects For The Prevention Of Water Pollution (Appropriations Completed Or Granted):

Starting Date	Title	Cost
May, 1961	No. 6 Merchant Mill	$ 400,000.00
April, 1964	Additional Thickener and Water Recirculation	540,000.00
February, 1965	New Basic Oxygen Steelmaking Plant and Discontinuation of Open Hearth Furnaces	440,000.00
Spring 1966	Continuous Casting Plant	370,000.00
Early 1967	Degassing Equipment	200,000.00
		$1,950,000.00

TOTAL WATER DISTRIBUTION W.S.W.
(Millions of Gallons Per Day)

1963 and Prior Years	Total Pumped	Outfalls To River	Eliminated Or Recirculated
North Pumping Station	98	98	0
South Pumping Station	22	22	0
	120	120	0
1964			
North Pumping Station	98	60	38 (Recir.)
South Pumping Station	22	22	0
	120	82	38
1965			
North Pumping Station	98	60	38 (Recir.)
South Pumping Station	6	6	16 (Elim.)
	104	66	54

MR. STEIN: Thank you very much, Mr. Miller.

Are there any comments or questions?

COLONEL CHESROW: It has been most heartwarming working with these industries. Their cooperation is really worthy of the highest commendation, especially as to yourself and those that have participated in the presentation. In fact, the five we picked from industry have been most cooperative.

MR. STEIN: Well, I think it speaks for itself, Mr. Miller. This is, I think, very good. I think the presentations here by several of the companies are a model of the kind of presentation and analysis and disclosure that I think can move pollution control forward.

I think there was always a suspicion we had that the companies were doing a reasonably good job if they would just tell us, and I think you have explained this very, very well.

MR. POSTON: I just wanted to tell Mr. Miller that I have heard from some of the Clean Streams Committee friends, and they have indicated to me that Wisconsin Steel was in the process of eliminating all waste effluents. I am very glad to read it here, because I really didn't feel that this was going to come about this quickly.

MR. MILLER: Thank you. It was my pleasure to talk before the Cook County Clean Streams Committee.

MR. STEIN: Thank you.

Colonel Chesrow.

COLONEL CHESROW: Mr. Harry Henderson, Director of Public Relations, Interlake Steel Corporation, who will speak on both the Chicago and Riverdale Plants.

STATEMENT OF
HARRY HENDERSON, DIRECTOR, PUBLIC RELATIONS, INTERLAKE STEEL CORPORATION

MR. HENDERSON: We are very pleased to be here to present our statement.

Mr. Chairman, Conferees, and ladies and gentlemen:

My name, as Mr. Chesrow has said, is Harry Henderson. I am Public Relations Director for Interlake. You don't mind a little plug here, do you Murray?

MR. STEIN: Not at all.

MR. HENDERSON: Interlake Steel Corporation is the newest major steel company in the United States. It was formed about a year ago through the merger of former Acme Steel Company of Chicago and Interlake Iron Corporation of Cleveland.

We employ about 4,000 people in our major Chicago area operations. We operate a steelmaking and fabricating plant in Riverdale, which is located on Chicago's southern boundary and on the Little Calumet River. Our coke operations are on South Torrence Avenue by Lake Calumet, and our large blast furnace plant is at Burley Avenue and the Calumet River.

I want to make it clear, Mr. Chairman, that I appear here this afternoon not as a technical expert but,

Harry Henderson

instead, to reaffirm Interlake's position and concern for and interest in pollution control.

Like other companies who are appearing here, we have been conducting many positive, voluntary control programs over the past years to keep our local environment as free as possible from wastes generated at our operations. We have spent millions of dollars on these programs, and we intend to do our part in the future.

Our efforts are well known to many of you folks in this room, and some of you have even taken the time to honor us for our efforts in the area over the years.

Three years ago the Calumet Chapter, Izaak Walton League of America, presented us with the IKE's Distinguished Sanitation Award for -- and I quote -- "outstanding progress toward the control of air and water pollution in Illinois." This of course was a reflection of our progressive policy, and we were the first Chicago area company to be presented with this award.

We have also been praised several times by the Clean Streams Committee for our voluntary cooperation. Just three weeks ago the Chicago City Council unanimously approved Mayor Richard J. Daley's resolution commending Interlake for its voluntary and expensive, I might say, pollution control activities, and this as far as we know was the first time in Council history that such a resolution has been presented and adopted.

Now, all this self-praise might sound self-serving to you, but we believe it has a particular purpose and we don't intend it to sound this way. I am merely trying to reflect that our company knows something about this problem and that we are recognized for having experience which can be of value to you gentlemen in this conference.

Colonel Chesrow has carefully reviewed -- and generously complimented us on -- results of recent tests his folks made at our Chicago facilities. We are proud of this dramatic improvement created by our accelerated control activities. So I am not going to take time here today to review these again. I think perhaps, however, our philosophy and record can best be illustrated at this time by this 12-page issue of our employee newspaper, the REPORTER.

At this time, Mr. Chairman, I ask that this issue be entered into the official record of these proceedings to represent our company's philosophy, support for and contribution to the pollution control.

MR. STEIN: Mr. Henderson, I will do the best I can with your photographs.

MR. HENDERSON: All right.

MR. STEIN: I hope my budget can stand it.

(Reporter's Note: Newspaper not reproduced in transcript.)

Harry Henderson

MR. HENDERSON: Also, sir, I would like with your permission to take two or three minutes to ramble through this issue with you folks up here as well as the people in the audience. It is about time you folks had something to do out there besides sitting and listening.

So, if you will, as you can see this issue was published in October. We entitled it appropriately: "Nature Needs Our Help." The issue is really an attempt to explain to our employees around the world and to community and government leaders the basic problems of pollution, how and why it occurs, what is being done by the steel industry and Interlake to control it.

As we move inside together to page three, we describe the elements in our recently announced $2.5 million pollution control program.

I don't expect you to read all this now, but since we do generalize on page three you might be interested in two particular specifics as they relate to our Riverdale and blast furnace plants.

A separate sanitary sewer system, as Colonel Chesrow said, is being presently installed at our Riverdale plant. It is now 80 per cent complete, and we expect it will be 100 per cent complete in two months. This installation, incidentally, cost us $325,000.

Harry Henderson

Also at Riverdale we are designing a new system of pickling with hydrochloric acid. Our investigations are complete, and our Board has very generously appropriated an additional $700,000 for this new regeneration plant. Some of the preliminary construction work is now in progress.

Back to the paper, pages four and five are devoted to a story about the company's engineering and scientific staff whom we charged with the responsibility of seeing to it that our control equipment is operated with maximum efficiency.

On pages six and seven we concentrated on special problems with wastes in steelmaking and the types of controls applied by the company to prevent these wastes from polluting air or streams.

Now, like everyone who has appeared here, we rely heavily on our employees for quick action in our control programs. On the top of page eight we describe how quick action by employees in our Toledo plant got a potentially serious leak under control before it could create a very heavy water pollution problem.

You will be interested also on that page in our pollution scoreboard, which perhaps for some of you lists for the first time in one place all the principal sources of waste in steelmaking and the types of controls required plus the relative degree of progress being made in controlling these wastes.

"Design for a Dust Trap" on page nine is a detailed story of a particular complicated piece of air pollution control equipment.

On page 11 there is a very important section for all steel companies and all companies, and we have entitled it, "We always want to be a good neighbor." I don't know one company represented here who does not practice being a good neighbor each day. On this page, as a consequence, we try to describe one of the ways we carry out our community relations philosophy -- a philosophy, incidentally, which is I know one shared by the men who are appearing here.

Now, the back page symbolizes our philosophy of close voluntary cooperation with key local pollution control officials. We certainly welcome this. As an example, we invited Colonel Chesrow and Mr. Vinton Bacon to visit us recently, and their visit shown here was mutually helpful.

At this point, Mr. Chairman, I would be remiss if I did not invite you and the rest of the gentlemen here and anyone in the audience to visit us and review our progress.

Will you please put the papers down for a while now? You can take them home with you.

Speaking of our progress causes me to turn to our editorial on page two. We conclude this editorial stating that many problems remain and we are working on them.

Would you put your papers down, please?

However, we must caution, we say in here, against hasty action by ourselves or by others. We would not feel we were doing the right thing by our employees, our stockholders or our neighbors should we put great amounts of money into projects which do not or which only partially solve the problem.

Interlake and the steel industry have for many years been leaders in this fight against pollution. We most certainly welcome advice from any quarter such as has been given us by the City of Chicago and the United States Government experts. We think that our ultimate aims are the same essentially as theirs.

But let us not forget this -- and we have beat this to death in this conference: We are in a costly fight against a costly enemy.

Yesterday here, Mr. Stein, you suggested one way industry might avail itself of Federal grants for pollution control, and that is by working with local agencies. We suggest there are some other possibilities, and at this technical conference I would like to present some of them very briefly.

Legislation, for instance, could be enacted conferring a special tax benefit on those who construct or acquire or install waste disposal and treatment facilities for the control of both water and air pollution.

We believe it is no longer enough for people to simply point the finger at private industry and say, "You are causing some of the pollution; do something about it."

At this technical meeting one thing has become very clear to us and to everyone: The purchase and installation of equipment to control pollution are a big expense. Control costs money.

I believe you gentlemen can help carry this story to the Congressmen of the Nation.

We subscribe to and support Senate Bill 1670 introduced April 1, 1965 by Senator Ribicoff on behalf of himself and 19 other Senators. His Bill points out, among other things, that at the 1962 National Conference on Air Pollution the cost of air pollution control equipment on the average was approximately 25 per cent of the basic production equipment. I don't know what the per cent is for water control equipment, but I imagine it is pretty substantial.

Now, unlike many capital outlays that ultimately produce new profits, these costs basically serve the health and safety of the public. Therefore, we believe it is entirely appropriate that there be some public sharing with private industry of the economic impact of these expenditures.

Now, gentlemen, we think it is downright unfair that industry be required to absorb the entire burden -- now I emphasize the "entire burden" -- of the tremendous expenditures for equipment and other facilities necessary to control pollution, when this equipment and other facilities will produce no income to the companies that install them. Since such equipment and expenditures are for a public purpose, the public should, therefore, assume part of the burden through tax relief.

Several tax proposals for accomplishing this objective have been suggested, one of which is to give the installing company an election to amortize the cost of such facilities over a 36-month period.

Another proposal would provide such company, in the year of construction or installation, with an investment credit equal to 20 per cent of the cost of these facilities.

Then, in conclusion, Mr. Chairman and gentlemen, this brings me to the proposed criteria being considered at this assembly. Until we fully evaluate the proposed criteria we received yesterday morning and translate these proposals into meaningful terms for us, we find we are unable to comment on them one way or another.

We realize that, as you rightfully said, Mr. Stein, in your opening comments -- whatever results from this conference might well become a "landmark." Our experience tells us, therefore, that we must assure ourselves, all of us, that the proposed criteria -- and we assume these are proposed criteria rather than standards -- we must assure ourselves, all of us, that our proposed criteria can lead to what you aptly termed realizable guides for judging the suitability of water in the future.

Now, all of us in this audience are working for reasonable objectives and attainable goals, goals that would not -- and again I quote you, Mr. Stein, in your very well-posed opening comments -- goals that would not unduly penalize industry.

Gentlemen, we don't want to be unduly penalized

Harry Henderson

by unnecessary but fully understandably enthusiastic haste. We, like others here, regard ourselves as fully cooperative leaders in pollution control, and from our experience we know how unwise it is to advance too hastily toward definite programs of corrective action without first reviewing again the complete practicality of whatever criteria are being presented.

Now, we are not asking or suggesting that anyone be given a free ticket to stall. Like Colonel Chesrow, we want whatever standards are adopted to be, in his own words, factual, firm and fair.

As a strong supporter, Mr. Chairman, of pollution control and community goodwill, therefore, and with our experience as a guide, we recommend to you and your associates that the adoption of the proposed criteria await further analysis and study on a new timetable.

We certainly appreciate and applaud the excellent work of the technical committee on a most difficult assignment. But we recommend that a brief pause take place in the positive momentum we are now enjoying here.

We hope others join with us in urging this action, because I know in the final analysis we all want to resolve at the nearest possible date a standard we can live by day by day.

What I am saying, in other words, is: Let's pause and take another look at the proposed signposts and direction markers so we can be certain that we all are picking the right road to our progress together.

Mr. Stein, thank you very much.

MR. STEIN: Thank you, Mr. Henderson.

Are there any questions or comments?

You know, I should point out to you that what Mr. Klassen said earlier is still true under our law and I suspect under the State law in the two States we are dealing with and, as far as I know, every other State. The responsibility for water pollution control under existing law rests with the pollutant, whether they get Federal assistance, State assistance or other assistance.

Goodness knows I am as much in favor of assistance as anyone, and I have worked very closely, as you may very well know, with Senator Ribicoff. And he was my boss. As a matter of fact, he had me up to Connecticut just the other week.

But do you know how many votes Senator Ribicoff got in that committee?

By the way, before I get into that, that amendment to the tax bill is not an amendment to our Act.

MR. HENDERSON: I know that.

MR. STEIN: It is an amendment to the Internal Revenue Code.

As far as I know, sir, the Treasury Department through both Democratic and Republican Administrations, and I am talking since I came back and began working on this pretty regularly, have been implacably opposed to this.

As far as I know, a bill for tax relief for industry has never had a hearing either in the House or in the Senate. It didn't get a hearing on this tax bill. Senator Ribicoff I think picked up two votes other than his in the Senate Finance Committee.

MR. HENDERSON: Yes, I know.

MR. STEIN: He picked up about 20-odd votes on the Floor.

You asked us to carry back the story. We know that story very well. I think when you talk about criteria, which I will get to in a little bit, the notion of diffusing industry's efforts by talking about accelerated amortization and tax relief off the top, with a kind of weak proposal anyway that isn't getting anywhere, really dissipates your forces in the beginning.

It might help to get behind one proposal.

The other thing is I would suggest your forum may not be this group.

Now, I am not saying this in any invidious way at all.

MR. HENDERSON: I understand what you mean.

MR. STEIN: Because one of the other jobs I have had or one of the other hats I have been wearing back in Washington is preparing reports on Federal legislation. I have never seen any reluctance on the part of your industry or the other industries represented here in going to the Congress and dealing with your legislation, as you have every right to do.

If you are talking about tax legislation, I don't know why this might not be the same avenue.

MR. HENDERSON: You posed something here a minute ago --

MR. STEIN: You can answer this, and I will give you full opportunity. For one reason or another, this proposal that you have made about financial relief for industry has been proposed to us by various industrial representatives from time to time. And I appreciate it. I wish you would talk about our legislation, but when you talk about our legislation talk to the Congressmen, not to us. This is your right, and I think you should do it. But I think this is the appropriate forum for that.

Now, let me give you my view on this, and I would like to go off the record.

(Discussion off the record.)

MR. STEIN: Back on the record.

MR. HENDERSON: There is one thing you suggested, Mr. Stein. I don't know if I am really on the right platform to do this, but I would like to take it upon myself.

We haven't had very much applause in this audience during these hearings, and I know it hasn't been called for. Despite whatever the degree of support or non-support we have for what is going on here, there is one thing we cannot overlook, and that is the tremendous amount of personal time and personal sacrifice these gentlemen on the stage have given to this problem and to the public good.

I would like, therefore, at this time for the record, sir, to ask the audience to join me in expressing their appreciation to you gentlemen for the effort and time you have put in.

(Hearty applause.)

MR. STEIN: Well, you are overwhelming us.

But I would like to make one more point. You plea for applause. You know there may be conservationists in the audience.

I know I have been dealing with Poole, Klassen and Poston at least since 1948, and as far as I know some of the people in the conservation movements have always said we are moving too slowly and we are playing "footsie" with the industry. The conservation organizations have said industry is moving too slowly, and the industry keeps asking for applause.

In some of our more relaxed moments -- and we have them sometimes -- I have discussed this with my old friends Blucher Poole, Clarence Klassen and Wally Poston, and we have arrived at the conclusion that as long as on one side we are asked to go slowly by industry and on the other side we are told we are not moving rapidly enough by the conservation organizations, maybe we are in the right ballpark.

MR. HENDERSON: Thank you.

MR. STEIN: Thank you.

At this point let us recess for ten minutes, and then we may move on to a conclusion.

(Whereupon, a recess was taken.)

MR. STEIN: May we reconvene?

Colonel Chesrow.

COLONEL CHESROW: Mr. Charles Murphy, Supervisor of Mechanical Assembly, Auto Assembly Division, Ford Motors.

STATEMENT OF

SUPERVISOR OF MECHANICAL ASSEMBLY, AUTO ASSEMBLY DIVISION, FORD MOTOR COMPANY

MR. MURPHY: Mr. Chairman, Conferees, ladies and gentlemen:

I wish to describe briefly the steps that the Ford Motor Company in our Chicago Assembly Plant has taken to provide some abatement of water pollution.

Our basic product is the assembly of automobiles, assembling the Ford car.

Since 1963, when we were first advised that effluents being discharged by the plant into the Calumet River were not in conformance with established regulations, we have spent considerable time, money and effort to be a good neighbor and to correct any faults we have had regarding pollution of the river.

After an initial study it was determined that waste waters given off from our Bonderite units and paint spray booths would require treatment to meet established standards. Therefore, engineering was undertaken to determine the most effective methods to be used to make corrections. The main problem concerned was the Bonderite units. Materials leaving these units dripped solutions containing undissoluble chemicals which entered the sewer to the river.

The basic problem was that these chemicals contained chromes, and the chromes had to be reduced from hexavalent to trivalent.

To this end, drain troughs were constructed to collect the drippings and discharge them into a mixing tank. Mixing equipment and metering pumps were added to produce the chemical reduction to the trivalent before they were discharged into the sewer.

The other problem was the matter of suspended solids in the waste water caused by effluent from the spray booth. Corrective action taken in this matter was the construction of a large sump with dual sump pumps, two large holding tanks of 50,000 gallons each, and a discharge pump and line approximately 1,000 feet long were routed to the sanitary sewer system.

This effluent was a result of quiescent settling and was entirely free of settleable solids.

Waste water from the spray booths and the lye tank was also diverted into this area into the holding and settling tanks. Here the solids settled out, and

Charles Murphy

one tank is slowly discharged while the other is being filled, a push-pull arrangement.

After an accumulation of solid matter has settled in the bottom of the tank, this solid material is cleaned out and hauled to a dump.

The above installations were made at a cost in excess of $100,000 and involves continuing costs for utilities, chemicals and maintenance.

Aside from this, directives have been issued to all personnel that extreme care be taken to prevent any contaminants from entering the sewer lines to the river.

After almost a year of operation of the above-described equipment, tests were made at the outfalls to the river and to the sanitary sewer. These showed considerable improvement. However, there were still some suspended solids and hexane solubles in the effluent of one of the lines to the river in excess of the desired levels.

Also, the tests revealed that the pH of the sanitary sewer line discharge was above set standards.

After a comprehensive study it was determined that the suspended solids and hexane solubles could only enter the line from the floor drains in the oil house and the excess pH condition of the sanitary sewer line would require acid additions for neutralization.

An appropriation of approximately $60,000 has been approved by the company, and contracts have been let for these further installations to reduce any conditions of pollution.

One installation will isolate the floor drains of the oil house and reroute them to an underground storage tank. When filled, this tank will be pumped out and the contents hauled to a dump off the premises, similar to the solids in the spray booth water settling tanks.

To control excess pH in the sanitary sewer line, a tank to hold hydrochloric acid is being installed along with testing, metering, recording and safety devices. This arrangement will continually check the pH of the sanitary sewer discharge line and meter and discharge acid into the sewer line as necessary to control any excessive pH condition.

The construction of these facilities is now being made, and completion is scheduled for May of 1966.

We expect upon completion of these facilities to be in compliance with all the regulations concerning industrial waste water pollution.

I thank you.

MR. STEIN: Thank you very much.

Are there any comments or questions?

Charles Murphy

(No response.)

If not, thank you for your presentation.

I think this was the last one. I have noticed that more public relations men are getting into the field, and they have something to shoot for when over the years engineers have developed the euphemistic term "sanitary" sewers.

Mr. Klassen, do you have any comments or questions on the Sanitary District's presentation?

MR. KLASSEN: I just wanted to reaffirm an understanding that I gained from the last conference. I was extremely interested in the tremendous improvement by the industries. Am I correct, however, in understanding that the prime responsibility for pollution abatement rests with the municipal sanitary district?

COLONEL CHESROW: Yes, it does by standard.

MR. KLASSEN: Inasmuch as this is a technical conference -- and I don't know whether you have the figures here -- but as kind of an overall summary of this improvement, what remains in the way of population equivalent still going to the streams that you anticipate is involved and will be involved?

In other words, what is the population equivalent entering the waterways.

COLONEL CHESROW: Not now but what remains?

MR. KLASSEN: What remains as amenable to cleaning? Is there an estimate?

DR. KAPLOVSKY: You mean our Calumet region?

MR. KLASSEN: Just the Calumet region.

DR. KAPLOVSKY: It would be very difficult for me at this time to give you the figure. It can be worked up though I am sure.

You mean what is the residual?

MR. KLASSEN: Yes.

MR. STEIN: Could you speak up, Doctor, please?

DR. KAPLOVSKY: The reason why we can't give you an answer is that in order for us to give an answer of what remains to be cleaned up we have to adopt first what the water uses will be in the streams so we can set a ceiling. Then we have to evaluate the stream itself because that is out of the stationary pool. Then there will be what we call a buildup.

So we get these two correlations, the ceiling and the buildup. Then we can turn back after getting information from industry and we can tell them whether they have to reduce this much in this category or so on.

So this will be a step-like approach.

In order to get things moving, we started out with minimum requirements, which most of them have succeeded in doing very well. The second phase will have to be answered in steps.

MR. KLASSEN: Have you any round figures as these industries go along to try to evaluate what this bulk removal is? All of the industries? There is tremendous improvement. Have you any estimate of what population equivalent was removed? I know this is probably equally difficult.

DR. KAPLOVSKY: What has been removed we could separate. We have it as a total figure. We keep a running account of all the pounds removed from sewers and from our streams together.

Now, they have added these together, and with our entire roughly 80,000 or 90,000 pounds BOD which you are talking about, something like six times this in population equivalent is taken out of our district area. Much of it has been in this area we are talking about.

MR. KLASSEN: Roughly 450,000 to 480,000 population equivalent?

DR. KAPLOVSKY: Yes.

MR. KLASSEN: Has been removed?

DR. KAPLOVSKY: Yes. And this is considerable.

I would like to make one statement in this regard. I am proposing this to Wally Poston. I noted a comment he made about Indiana Shipping Harbor where Mobil

I think mentioned some of the things they had accomplished. I think we, in all fairness to the industry who are discharging that, where they have made accomplishments as of this date that they have recorded in the last six or eight months, the effect of this would be extremely unusual if we could find it in our monitoring stations at this time. Because you will have so much residual that it will camouflage a lot of good work that has been accomplished.

My guess would be if we go back in a year or so, maybe next summer, maybe in 18 months, especially in a stream that is moving fast, we will see results. If it is a sluggish stream it might take two to two-and-a-half years to show different qualities.

But I think in a couple of months, probably by the accomplishments of the past season will begin to be shown analytically.

MR. KLASSEN: One other thing. I don't have your presentation right in front of me, Colonel, but is my recollection correct from your statement that 300 days after you award the contract for chlorination equipment at the Calumet station you expect to be in operation?

COLONEL CHESROW: Yes. That's right. That is written in.

MR. KLASSEN: That is roughly 1967 sometime?

COLONEL CHESROW: Yes. By January of 1967. The end of this year or the early part of 1967. That is spelled out in the contract.

MR. STEIN: I have a little question on that, now that that has been raised, and I skipped it at the time. You mentioned that, but then you talked about the 95th Street chlorination facilities scheduled for award on February 24, 1966. How many days will that take? That is right at the bottom of page four.

Is that 300 days too?

DR. KAPLOVSKY: No. That involves a hydrochloride tank that has been designed that will have between 5,000 and 10,000-gallon capacity. The experiment there is a little bit unusual. It is not a standard chlorinating type facility.

In order to dose a system that rarely, and I mean rarely, overflows, we may have maybe an hour or so in three or four months or not even at all in a season. So you have to have a chlorinating facility as a standby. It is very, very expensive.

However, in order to store something and to make sure that it is effective, it will change with time and temperature, so you get involved in chlorine changing its strength.

So we have been running experiments of different strengths of hydrochloride to find out what we can expect in the way of concentration that we can have as a standby, because the whole size of the operation is dependent on it.

Also we may find that we may have to put in some cooling system for the tanks so we don't lose our chlorine, because it will be a one-shot once we have a spill, and it just has to stand there as a reserve.

So it is an oddball installation designed to meet the needs.

COLONEL CHESROW: It is most unique.

MR. STEIN: I recognize it is unique, but let me ask the question again. You have a design. You are going to award this for contract on February 24, 1966. Right?

DR. KAPLOVSKY: Yes.

MR. STEIN: Are you going to put in a time specification for completion of the construction?

DR. KAPLOVSKY: I might say all of our contracts do have this. This one was omitted, and I do not nave the exact date. I am merely trying to point out that it involves merely a holding tank.

MR. STEIN: Right.

DR. KAPLOVSKY: That shouldn't be too lengthy.

MR. STEIN: No, it shouldn't.

I should say that these people were told before they came here that this would be a technical session.

Are there any further comments or questions?

Mr. Poston.

MR. POSTON: Are you prepared to make a final statement here? I would like to make a statement before that.

MR. STEIN: All right. Before you do, Mr. Poston, I would like to indicate that Mr. Nelle is not here any longer accompanying Mr. Klassen for Illinois. His long-time colleague Mr. Douglas Morton is with Mr. Klassen. We have all worked with him for many years. We know his efforts in pollution control.

Mr. Poston.

FURTHER STATEMENT OF
H. W. POSTON, CONFEREE

MR. POSTON: I think it might be appropriate for me to summarize what I think has gone on up to this point in this meeting.

I think that the conferees have listened to discussions here from municipalities and industries on their waste control programs, and I think that a lot of progress has been made since this conference met last in March of 1965, but that there is still pollution in the Calumet area waters and it is going to require abatement.

The technical committee has come forth with a report. Admittedly, they have made a big effort, and with competent members on this committee. In general, I think the report has been acceptable, but there is a feeling on the part of some persons who have been heard that they have not had the opportunity to give this report the study that they feel it should have so that they can make comments which they would like to do.

Personally, the report has pleased me very much.

I think again that industry has made a lot of progress. As Mr. Kaplovsky mentioned a minute ago, the results that have been obtained by our surveillance crews have not exactly jibed with some of the results as indicated by industry where they have shown up to 70 or 80 per cent reductions, but I think maybe Mr. Kaplovsky has a partial explanation of this in that there is already a lot of contamination in there that hasn't been fully purged from the system.

And then some of the larger polluters did not give these high figures of reduction. Some of the larger polluters did not indicate that they had removed these high percentages of waste.

From discussions on the amount of time that is required to completely abate this pollution, it appears to me that it would not be out of order to expect the completion of preliminary planning for all of the abatement works by July 1966, that completion of final plans and specifications by January 1967 wouldn't be out of order, and that complete construction and placing treatment facilities in operation by July of 1968 would not be out of order.

I think that it was evident that the present surveillance activities need expansion, and I think that all industry, the enforcement agencies, the State agencies and the Federal agencies, meaning Department of Health, Education, and Welfare, all need to participate in this activity on a cooperative basis.

I think that there was some discussion on the laboratories, and I think laboratories need to continue to work together in a long-range program to obtain uniformity in their methods and precision of their results. The industrial, the municipal and the regulatory agency laboratories should be invited to get together on this thing.

I think that the information relative to the characteristics of the industrial wastes needs to be put out in the open a little more. I notice that some of the industries were very forward in telling not only the concentrations of their wastes but the total flow and the total pounds of wastes. I think this is good. And before finally we get the pollution abated we must know on an individual basis -- individual sewer outlet I mean -- exactly what comes from these particular outfalls.

I think, finally, that public progress meetings such as this are most important. They are an excellent means of letting the public know what is being done about the pollution which affects them as they use the public waters of Lake Michigan and the Calumet area.

It is right in line with the intent of the law that we solve these pollution problems by a public meeting where we sit around a table and, being reasonable people, we can come to a common agreement without going through the process of a hearing where you take sworn testimony or the actual going to court and having court action.

Mr. Chairman, I submit that this is my summary of what has gone on heretofore in this two-day session.

MR. STEIN: I think since that is from the Commissioned Corps it shows we have democracy.

Are there any other comments or questions?

(No response.)

In talking to the conferees up here and using my colleague's on the left shaggy dog technique in wandering back and forth in trying to sense a consensus here, I think the conferees have been impressed by the tremendous work done by the technical committee. We recognize that some 200 items have been presented by the technical committee, a lot of these relatively new, having relatively new concepts, maybe involving questions of difficulty and unsureness of measurement, and so forth, but certainly a much broader spectrum of indicia of pollution than we have had before.

I might say I think we need this, because I have always had the theory that this cuts both ways.

As we get more precise we may find that we have a little more waste in the stream -- and I don't say this from point of pollution. When we have a very crude technique or crude measurement device, you tend to compensate because you are not sure, and you may be overcompensating.

I think a precise measure would disclose that.

The technical committee has come up with this, and I think we have evidence of the best of goodwill from the States of Illinois and Indiana and the Sanitary District and I think the Federal government and the cooperating industries, particularly the oil and steel industries, in developing these technical requirements.

I think also we must recognize from the cities and the industries too that considerable progress has been made. I think that industry after industry coming up and talking about 90 per cent reductions in waste shows what can be done when you put your mind to it.

We have witnessed more than talk here. We have witnessed a tremendous improvement. The way I look at this, not only has the improvement been tremendous that has been outlined here by the cities and the industries, but the plans are practical and, if carried out, they should go a long way, if not all the way, toward reducing pollution.

I have every hope and every confidence that these plans will be carried out.

You people have heard the presentations here. You can make the same evaluation that I can about the will and the sincerity of the people who made them. I have full confidence in them, and I am sure that it will be done.

Recurring through the presentations particularly of the industry representatives was the theme that industry had not had enough time to review and evaluate the proposed criteria presented by the technical committee. Many of the industries indicated they just saw these for the first time last Wednesday. They asked for more time to do it.

Now, I think that we all recognize that this pollution abatement program is going to cost millions upon millions of dollars. A good portion of these are going to be public funds, and also a large portion will come from private industrial sources.

I think -- and I hope I am expressing the consensus of the conferees and will throw this open for them later to make any modifications or any adjustments that they may wish -- that before we can in good conscience ask the industry and the cities to proceed to meet these requirements, set up time schedules, we should have the benefit of the technical people's advice from the cities and industries in the area.

You all have had an opportunity to obtain this report on the proposals of the technical committee. If you have not, it will be made available to you immediately.

So, therefore, it is proposed that we recess the conference to give industry and the municipalities time to do it.

I know the technical competence represented here. It is probably, from an industrial point of view certainly, and probably from a municipal point of view, as great as we have ever assembled in one room at one time in the country, bar any meeting anywhere. And I think it is reflected in the kind of record we have made.

What we are proposing is that, if the technical people get the copy of these proposals right away, place themselves in the position of analyzing them on a priority basis and get their comments in writing in to their appropriate agency in Illinois, Indiana, or the Sanitary District, when they get it they can distribute copies of the comments to the other conferees, and the conferees will reconvene again to consider this in executive session in Chicago on January 31 of this year, hold that executive session to consider the recommendations of the technical committee in the light of the comments and review made by the people concerned, and in addition to that the technical committee will consider a time schedule for remedial action.

I think you have heard Mr. Poston's views. I heard them for the first time myself. This might give you an indication of his thinking, and we have had some indications of time schedules in the various reports of industry.

If you have any further thoughts on this, I also suggest that the time schedules be made available to your appropriate agencies, either to Colonel Chesrow, Mr. Klassen or Mr. Poole. They weren't forthcoming in all cases.

I hope the conferees will not have to be in a position of establishing a time schedule by default without having the benefit of the views of the industries and cities concerned because they didn't take advantage of this.

I would urge you to get your suggestions in to these people so we can consider them.

Now, I think the conferees are rather familiar with the program and the problems involved. It is expected that the conferees will have a public announcement, and we will have a public meeting on February 1 and make an announcement concerning the criteria and concerning a time schedule.

We will also announce the place where we are holding the executive meeting, in accordance with what I consider ordinary good taste and good government practice. You may not be able to come in to the executive meeting, but we are not going to crawl into a catacomb somewhere. We will tell you where we are going to hold it and where we are going to be.

Are there any comments?

(No response.)

The date for the convening of the executive meeting will be Monday, January 31. The meeting will go on until we come to a conclusion. But on present indications we can expect to come out with an announcement sometime on February 1, and we should be able to announce on the evening of January 31 about what time you can expect the announcement on February 1.

That gives us, or you, several weeks in order to do this work. I think we have been dealing with this problem for a long time. We have gotten a considerable amount of momentum started. I don't think we should abate our actions to abate. If we keep on moving I am sure we will come up with an equitable solution.

I might say we have achieved so far, from what I see, the closest possible or closest kind of agreement that I have ever seen achieved in a pollution problem before, let alone a complex one like this.

In my view, the differences are not very extensive, but I think in order to get a viable program to which we are going to commit many, many millions of dollars we have to be absolutely certain, and I think this extra few weeks that the conferees are proposing to take will be well worth the investment and assure that certainty.

Are there any comments or questions from the conferees?

MR. KLASSEN: None other, Mr. Stein, than to emphasize, while this opportunity is being given, we expect -- at least I hope as one conferee -- to arrive at a decision there. I can say from our standpoint I am going to have to be convinced that the present ones aren't satisfactory and workable.

I say if anyone wants to send comments to me they had better be documented with some good reasons, because I am going to have to be argued out of the present ones, not argued into something else.

MR. STEIN: Well, Mr. Klassen, you know I am reputed to have been the star pupil of the foremost school of charm, and one of my charming features is to hold people at a meeting until they arrive at a position. (Laughter)

So I would think, gentlemen and ladies, that the indicator points to a decision and a real good decision, and I hope a fair and equitable decision, by February 1, and we will solicit your views so they can be considered and incorporated in the decision.

I think again we are responding to the repeated requests of the industrial representatives that they need more time, a little more time, to look at the criteria. We are happy to extend it, and we would be happy to hear your views.

Now, I would like to thank you all for coming, because I think we have participated in one of the most productive conferences we have had, and I think we are on our way to a clean Lake Michigan.

Thank you.

We stand recessed until February 1, when we will reconvene at a place to be announced in Chicago.

(Whereupon, at 4:35 p.m., the conference was recessed, to be reconvened on February 1, 1966 in Chicago, Illinois, at a place to be announced.)

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